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U.S.A. Rep. Comm. Rabies, U.S. Live Stk Sanit. Ass., 1942, 44.
—. Rep. Comm. transmiss. Dis. Swine, U.S. Live Stk Sanit. Ass., 1942, 50.
—. Rep. Comm. T.B., U.S. Live Stk Sanit. Ass., 1942, 40.
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DISEASES CAUSED BY BACTERIA AND FUNGI

BIDDLE, E. S. (1944). **A comparative study of the blood plate, Hotis test and Breed smear as used for the laboratory diagnosis of bovine mastitis.**—*N. Amer. Vet.* **25.** 476–479. **241**

The blood-agar medium contained 0·2% glucose and 10% citrated ox blood. A loopful of milk was streaked over a quarter of the surface of a plate. Haemolytic and non-haemolytic streptococci were isolated and identified by means of a rapid agglutination test. In the Hotis test the original technique was used and all tubes having typical small yellow flakes or balls of growth were considered positive. The smears were prepared from incubated samples and stained by the Breed method. The Hotis test was compared with the blood-agar plate method in the examination of 2,336 milk samples, of which 14·6% were shown by the plating method to contain *Str. agalactiae*. The Hotis test failed to detect 26·82% of these positive samples, it gave false positive reactions in a few instances, and it did not react to the presence of *Str. uberis*, *Str. dysgalactiae*, Lancefield group G streptococci, or *Staphylococcus aureus*. A total of 1,272 milk samples was examined both by the Breed-smear and the blood-plate methods. Of the 154 samples which were positive to the latter test, the microscopic test failed to detect 9·74%, mainly because the infecting organisms were short-chain varieties of *Str. agalactiae*. It is concluded that the blood-agar plate test is more efficient than the Hotis test or the Breed smear in detecting *Str. agalactiae*; it also obviates false positive results and is equally rapid.—J. KEPPIE.

KNAYSI, G., & GUNSALUS, I. C. (1944). **A study of the so-called Marburg and the Lawrence and Ford strains of *Bacillus subtilis*.**—*J. Bact.* **47.** 381–389. **242**

The authors conclude, from a study of physiological and biochemical characteristics, that the Lawrence and Ford strain of *B. subtilis* and the Marburg strain differ sufficiently to be classified as distinct species. If the Marburg strain is to be accepted as *B. subtilis*, then the Lawrence and Ford strain should be re-named. —R. M. ARNOLD.

*BEKKER, J. H. (1941). Les mutilats du bacille charbonneux. **[Irreversible dissociation in the anthrax bacillus].**—*Antonie van Leeuwenhoek ned. Tijdschr. Hyg. Microbiol.* **7.** 180–184. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 337]. **243**

Non-sporing strains of the anthrax bacillus were obtained by culture at 42°C.; these strains differed in some respects from the original spore-producing strains. Whilst most of the non-sporing strains either died out or regained their spore-producing faculty, six non-sporing strains had been maintained for seven years. It did not prove possible to induce spore formation again in these strains, and B. considers them to be "Mutilaten", in the sense of VAN LOGHEM.—U. F. R.

DA CONCEIÇÃO, J. M. (1942). A patogenia da tuberculose dos animais, com referência especial à tuberculose da mama nos bovinos. **[Pathogenesis of TB. in animals, with special reference to udder TB. in cattle].**—*Rev. Med. vet., Lisboa.* **37.** 15–36. **244**

TB. in the horse does not take the form of the development of classical tubercles; the lesions are more apt to be waxy in nature and, on section, to resemble granulation tissue. In carnivores, the lesions are as a rule proliferative in type, and diagnosis may be confirmed only by histological examination. In swine, lesions are proliferative or exudative, according to whether the infection is by avian or bovine type bacilli. In cattle, tuberculous lesions may be proliferative or exudative.

Infection in the domestic animals may be *via* the respiratory, digestive, or congenital routes. Investigations by the author showed that the primary focus of infection in over 20,000 calves was present in the liver in 48% of cases, in the lungs in 39%, and in the digestive tract in 13%. He states that in the horse and pig the primary complex is constantly in the digestive tract. In the dog, the primary focus is sometimes in the lung and sometimes in the digestive tract, in the ileo-caecal region. In the cat, primary infection is usually enterogenous, in the ileo-caecal region.

Generalization from a primary focus in the immature bovine animal, is characterized by the presence of miliary nodules in almost all the organs, with constant lymph node involvement, although in the kidney, liver, and spleen, lesions are not generally macroscopic. In the young animal, the udder is never the seat of miliary localization, since it is then in its most rudimentary stage of development. Endogenous reinfection from a primary focus gives rise to a chronic organic TB., involving particularly the lungs and udder. Occasionally the uterus and testicle are involved, giving rise to the possibility of congenital spread and spread by coitus respectively. Chronic TB. of the lungs may take the form of catarrhal broncho-pneumonia, the form in which cavitation develops, or ulcerative tracheobronchitis. Udder TB. occurs in three forms, *viz*, the miliary type which is extremely rare, the lobular infiltrative form or chronic udder TB. which constitutes about 90% of cases, and caseous mastitis, which as a rule follows pre-existing udder TB., or which may follow lymphogenous and haematogenous spread from a chronic organic TB. lesion, often from the lungs. Occasionally, cattle affected with chronic organic TB. develop a late generalization, which may be attributed

to a diminution in resistance of the host, following lactation or any other debilitating factor.
—ISOBEL W. BROCKLEHURST.

—. (1943). **Report of the committee on tuberculosis [U.S. Live Stock Sanitary Association].**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 98–100. **245**

The report shows that while in 1917 about one in every 48 cattle slaughtered in the U.S.A. showed lesions of TB., in 1942 the proportion had declined to 1 : 1,600. In swine in 1922, about one animal in seven showed lesions of the disease, while in 1942 the proportion was 1 : 13.—D. D. OGILVIE.

MOHLER, J. R. (1943). **Highlights and shadows in tuberculosis eradication.**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 8–12. **246**

The first tuberculin test in the U.S.A. was made in 1892. The 50-year period of testing since then is regarded as 25 years of preparation and 25 years of fulfilment. In the latter period over 20 million herds containing about 242 million cattle have been tested and approximately 4 million reactors detected. Large-scale field testing commenced in 1918. The first state to achieve a modified accredited status was North Carolina in 1928. The last state to be accredited was California in 1940. To obtain these results, an overall average of about 2,000,000 cattle per month had to be tested during the period. More recently, all cattle in the Virgin Islands, numbering about 13,000, have been tested without any reactors being disclosed and in the U.S.A. it is now a frequent experience to test 20,000 or more animals without finding reactors. It is considered that complete eradication can, and will, be accomplished.—D. D. OGILVIE.

POTTENGER, F. M. (1944). **Epidemiology of reinoculation tuberculosis. The epidemiological importance of the course of bacilli and the route of invasion in the reinoculation types of pulmonary tuberculosis.**—*Amer. Rev. Tuberc.* **50.** 112–121. [Spanish summary]. **247**

In addition to preventive measures directed against exogenous infection, P. stresses the importance of secondary endogenous foci as sources of subsequent clinical TB., and indicates the necessity of more accurate information on the bacillary invasion rate.—A. B. P.

BOISSEVAIN, C. H. (1943). **Survival of tubercle bacilli in solutions containing glycerol or its oxidation products.**—*Proc. Soc. exp. Biol., N.Y.* **54.** 342–344. **248**

Tubercle bacilli suspended in distilled water, or in solutions of inorganic salts in the presence of air, may remain viable for a year, but although glycerol is essential for growth and is a component of Long's synthetic medium, when organisms were suspended in 6% glycerol in distilled water they died within 2–4 weeks. The possibility that death might be due to traces of long-chain fatty acids or soaps of these acids was excluded by the use of redistilled and also synthetic glycerol. In addition to glycerol itself, B. studied the effects in 0·1% concentration at pH 7 of the glycerol metabolites, glycerophosphoric acid, phosphoglyceric acid, glyceric acid, glyceraldehyde, dioxyacetone, lactic acid, and pyruvic acid, and found that while glyceraldehyde and dioxyacetone killed the bacilli readily, the remaining substances were much less active, pyruvate having no lethal effect whatsoever. Since tubercle bacilli can multiply when suspended in pyruvate in the presence of sodium phosphate, and pyruvate was demonstrated *via* its dinitrophenylhydrazone to be an intermediary in the dehydrogenation of glycerol by these organisms, B. suggests that the lethal effect of 6% glycerol in distilled water may be due to an attempted four-atom dehydrogenation of glycerol to pyruvate which cannot be accomplished in the absence of phosphate, potassium, magnesium, and a source of nitrogen (asparagine).—ALEX. B. PATERSON.

*I. HEGYELI, Z. (1943). **[Experimental infection trials with swine erysipelas bacteria].**—*Közl. Összehas. élet- és kórtan Köréből.* **31.** 109. **249**

*II. HEGYELI, Z. (1943). **[Hyperimmunization trials with swine erysipelas bacteria in pigs].**—*Ibid.* 112. **250**

[Absts. from absts. in *Dtsch. tierärztl. Wschr.*/*Tierärztl. Rdsch.* **51**/**49.** 55].

I. Artificial infection of pigs with *Erysipelothrix rhusiopathiae* (the bacillus of swine erysipelas) is difficult to establish, even when large doses of bacteria are used, although quite small quantities of vaccine may lead to infection in certain circumstances. H. found that intranasal inoculation of a concentrated emulsion of *E. rhusiopathiae* into six non-immunized store pigs, led to typical symptoms and death in every case.

II. The greater the number of bacteria present in a 24–48 hour culture of the swine erysipelas bacillus used as antigen, the higher is the immunizing value of the antiserum produced. H. found that a better antigen was produced by bacteria grown in broth made with pork than when horseflesh was used. By this and other means, he was able to produce a hyperimmune serum, 0·05 ml. of which protected a pigeon against 0·5 ml. of virulent *E. rhusiopathiae* culture.—A. F. RUSSELL.

DELAPLANE, J. P. (1944). **A pasteurella or pasteurella-like organism as the cause of an infectious sinusitis of turkeys.**—*Poult. Sci.* **23.** 247–249. **251**

A pleomorphic Gram-negative organism is described which was recovered from infectious sinusitis of turkeys. The exudate from the turkeys and the cultured organism both produced a disease in chickens characterized by distention of the nasal chambers with caseous material, which in turn set up a typical sinusitis in turkeys. Inoculated rabbits and mice were not affected, although the organism could be recovered from the livers of mice killed 48 hours after inoculation.

In agar, colonies are small, rounded, flat, and white to bluish-white ; in broth there is clouding, and later flocculation, the organism forming filaments, large round forms, rods, and chains. Gas is produced in meat-mash medium and also in blood at the base of agar slants, the blood being haemolysed. Litmus milk is unchanged by the organism, neither H_2S nor indole is produced, the methyl red test is negative, and nitrates are reduced. Fermentation of rhamnose, trehalose, inulin, raffinose and dextrin differentiates the organism from *Pasteurella aviseptica.* [There is no mention of bipolar staining or of capsule formation.]

Sulphathiazole (0·75–1·0 g. to mature turkeys) may be useful in early cases of the disease.—R. A. ROPER.

DARBY, C. W., & STAFSETH, H. J. (1943). **Salmonella infections common to man, animals, and birds.**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 189–202. **252**

The species incidence of members of the genus *Salmonella* in farm poultry in the U.S.A. is recorded, together with the incidence of these organisms in man and domestic animals. A list is given of 35 species occurring in fowls in the U.S.A. and their significance in man and animals is discussed. Practically all of the organisms directly affect fowls and they are responsible for many of the losses in chicks and poults. Their public health significance is undetermined. Numerous cases of paratyphoid food poisoning from infected duck eggs have been recorded in man, but there are few

reports incriminating chickens and turkeys as sources of human food poisoning.—D. D. OGILVIE.

HINSHAW, W. R., & MCNEIL, E. (1944). **Gopher snakes as carriers of salmonellosis and paracolon infections.**—*Cornell Vet.* **34.** 248–254. **253**

While investigating the possible mode of transmission of *Salmonella meleagridis*, which had been isolated in California from each of six batches of turkey poults, the authors killed a gopher snake (*Pituophis catenifer deserticolor*) which had just consumed six one-week-old Buff Rock chicks. From the liver of the snake, *S. meleagridis* and a paracolon bacillus were isolated. *S. panama* was isolated from the ingested chickens. Examination of three further gopher snakes found in the turkey yards and of two sick poults all yielded the paracolon bacillus, but none yielded *S. meleagridis*. Neither organism was isolated from a fifth snake found dead about two miles from the ranch. The paracolon types were found to have identical H antigens to Edwards, Cherry & Bruner's type 8, but unidentified O antigens. Details of the cultural and antigenic studies are given.

This is believed to be the first isolation of a true salmonella type from a snake, although paracolon types 1 and 10 have been isolated from Gila monsters (*Heloderma suspectum*) and rattlesnakes respectively, type 10 having also been isolated from poults. Circumstantial evidence suggests that the paracolon type 8 may have been introduced from a Californian hatchery, from which a type 8 paracolon had been isolated in an acute outbreak in poults, cultures of which caused an 18–25% mortality in experimentally exposed chicks. These findings direct attention to the possibility of reptiles being transmitters of salmonella and paracolon infections in poults and chickens.—H. I. FIELD.

HUBBARD, E. D. (1944). **Calfhood vaccination against brucellosis.**—*J. Amer. vet. med. Ass.* **104.** 84–85. **254**

Statistical data are given on the effect of calfhood vaccination in Iowa since its commencement in 1936. Some batches of vaccine caused the production of agglutinins in 100% of the vaccinated animals, whilst other batches set up agglutinin production in only some of the calves, varying from 79% upwards. Very few vaccinated animals abort, but an important percentage will react 18 months or more after vaccination. Further investigation is necessary of the duration and significance of the effects of vaccination.—S. J. GILBERT.

KERBY, G. P., BROWN, I. W., Jr., MARGOLIS, G., & FORBUS, W. D. (1943). **Bacteriological observations on experimental brucellosis in dogs and swine.**—*Amer. J. Path.* **19.** 1009–1020. **255**

Two strains of brucella were used for infection, consisting of one isolated from the spleen of a naturally infected pig and highly virulent for g. pigs and another obtained at autopsy from a human case of Hodgkin's disease and only slightly virulent for g. pigs. It was found that brucella disappeared from the bloodstream of experimentally infected dogs and pigs within 1–3 weeks, but could be recovered from the tissues in some cases 3–7 months later. When the organism could not be obtained by blood culture and there was no evidence of clinical infection, it was sometimes recoverable P.M., most frequently from the lymph nodes. Infection was frequently established by intravenous inoculation, whereas it was very difficult to establish by intraperitoneal inoculation. Opsonocytophagic indices of both dogs and pigs were variable and could not be correlated in any way with the course of the experimental infection. There was no striking difference in virulence for dogs and pigs between the two strains despite the differences in pathogenicity of the two strains for g. pigs.—S. J. GILBERT.

KOTLYAROVA, K. S. (1942). Brutsellez i bor'ba s nim. **[The struggle against brucellosis].**—*Zh. Mikrobiol., Moscow.* No. 11/12. pp. 79–81. **256**

Brucellosis was first reported in human beings in Russia in 1911, but no organized control was undertaken until recent times. It is recognized that infection in human beings is mainly associated with brucella-infected sheep farms and that without organized eradication of the disease among sheep, no complete control of human infection can be achieved. Satisfactory results have been claimed on infected sheep farms by using the intradermal skin test, together with agglutination tests, segregating the reactors, and rearing lambs away from older sheep.

The All-Union Institute for Experimental Medicine is chiefly responsible for control of, and research on, human brucellosis.—A. MOLDAWSKY.

*BELLUCCI, G. (1942). Scomparsa del fenomeno paradosso in corso di vaccinoterapia antimelitense. **[Disappearance of the paradoxical phenomenon in vaccination therapy of undulant fever].**—*Boll. Sez. ital. Soc. int. Microbiol.* **14.** 103–104. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 344]. **257**

The disappearance of the paradoxical phenomenon in the course of the vaccine treatment of undulant fever is explained by the recovery of the optimum antigen-antibody ratio.—U. F. RICHARDSON.

LEGROUX, R., & JÉRAMEC, C. (1943). Diagnostic bactériologique du botulisme. **[Bacteriological diagnosis of botulism].**—*Ann. Inst. Pasteur.* **69.** 47–49. **258**

Suspected food is examined and a microscopic examination is made of portions where the colour or texture is altered. Deep cultures are made on gelatin-agar after heating the seed material at 70°C. for half-an-hour, and suspicious colonies, appearing 2 cm. below the surface are picked into 2% glucose broth, sealed, and incubated for seven days. Cultures are then filtered and 0·1 ml. of filtrate is injected subcutaneously into g. pigs. The toxicity of primary cultures is variable, but by growth on a suitable medium more potent filtrates can be obtained. The toxin is then typed against *Clostridium botulinum* Types A and B antitoxins, these being the only types known to occur in human food poisoning.

For a rapid diagnosis, as a basis for treatment, a crude extract of the suspected material is made and injected into g. pigs, each protected against one type of toxin. Death of the unprotected g. pig gives a diagnosis within 18 hours.—R. M. ARNOLD.

PIKE, R. M., & FOSTER, A. Z. (1944). **Demonstration of sulfonamide inhibitor production by bacteria on agar containing sulfonamide.**—*J. Bact.* **47.** 97–105. **259**

The production of extracellular sulphonamide-inhibiting substances by bacteria was demonstrated on solid media containing sulphonamide by observation of the ability of a heavy, concentrated inoculum to make possible the growth of a lighter, dispersed inoculum of the same or another strain which would otherwise have been inhibited. The resulting formation of satellite colonies depended upon the concentration and bacteriostatic power of the sulphonamide used and the susceptibility of the satellite strain. Highly resistant bacteria did not necessarily stimulate satellite formation. The growth of satellites appears to be due to the diffusion through the agar of sulphonamide-inhibiting substances elaborated by the test colony.—J. M. ROBSON.

See also abstr. **400** (streptococci), **301, 302, 381-385, 403-405** (TB.), **310, 413** (tularaemia), **377, 401, 406** (salmonella), **305** (tetanus), **387** (gas gangrene), **319, 321, 322** (brucella), **299-300** (bacterial toxins).

DISEASES CAUSED BY PROTOZOAN PARASITES

ROVEDA, R. J. (1944). El vacuno repositario del *Trypanosoma equinum* Voges, 1901. **[Cattle as reservoirs of *T. equinum* infection].**—*Rev. Fac. Agron. Vet., B. Aires.* **10.** 530–535. [English and Portuguese summaries]. **260**

From his work on *T. equinum*, R. shows that cattle may act as carriers of this parasite. Trypanosomes could not be found in blood films of cattle injected with virulent blood, but their blood was infective to g. pigs. The inoculated cattle showed no clinical signs of infection. The maximum observed duration of the carrier state was 110 days, and the minimum 53.—M. WATSON.

MORGAN, B. B. (1944). **Normal agglutinins in vertebrate sera for *Trichomonas foetus* (Protozoa).**—*Proc. helminth. Soc. Wash.* **11.** 21–23. **261**

In tests of the sera of several specimens (usually ten) of each of two species of fish, one lizard species, one frog species, 5 species of birds, and 15 of mammals, they were found to agglutinate *T. foetus* in dilutions of 1 : 1 to 1 : 1,024. More agglutinins were contained in the bird sera than in the sera of the cold-blooded animals, but only the mammals had agglutination titres higher than 1 : 16. Of these, the rabbit was weakest in agglutinins with a titre of 1 : 4, whilst the horse was strongest with a titre of 1 : 1,024.—M. L. BINGHAM.

DE BENEDETTI, L. M. E. (1944). Influencia de factores climáticos sobre los ooquistes de *Eimeria tenella*. **[Influence of atmospheric conditions on oocysts of *E. tenella*].**—*Rev. Fac. Agron. Vet., B. Aires.* **10.** 544–557. [English and Portuguese summaries]. **262**

The author studied the viability of oocysts of *E. tenella* under various atmospheric conditions. He found that dry or moist heat, desiccation, cold, lack of oxygen, and putrefaction were all inimical to normal development of the oocysts.

He suggests that avian coccidiosis due to this parasite may be controlled by dry cleaning of houses and runs, exposure of the birds' quarters to direct sunlight, and the drying of removed excreta in shallow layers in the sun before disposal.—MILLER WATSON.

SHORTT, H. E., MENON, K. P., & IYER, P. V. S. (1941). **The natural host of *Plasmodium gallinaceum* (Brumpt, 1935).**—*J. Malar. Inst. India.* **4.** 175–178. **263**

From a study of the morphology, cross-immunity, and cross-agglutination reactions of strains of *P. gallinaceum* from wild and domestic fowls, it is concluded that the strains are identical. The original host of *P. gallinaceum* is probably the jungle fowl, different species of which exist in different localities.

—B. C. BASU (INDIA).

ENIGK, K. (1943). Zur Epidemiologie der Pferdepiroplasmose. **[The epidemiology of equine piroplasmosis].**—*Dtsch. tropenmed. Z.* **47.** 333–338. **264**

Equine piroplasmosis (*Babesia caballi* and *B. equi* infection], occurs throughout Africa, in Asia, in southern and eastern Europe up to latitude 50°, and in tropical and subtropical areas of America. In some areas it is seasonal either in the spring or summer, whilst in others it occurs all through the year except during the winter. Information as to vectors is reviewed and it is concluded that transmission may be effected by three species of *Hyalomma*, three of *Rhipicephalus*, and two of *Dermacentor*; probably related species of these genera can also transmit the disease. In the case of the three-host ticks, the larvae may acquire infection and it may occasionally be transmitted by the nymphs. When infection is acquired by adult ticks, it is not transmitted until the imago stage of the next generation. The disease is thus ordinarily transmitted by adult ticks, and its prevalence corresponds with the greatest prevalence of adult ticks. In districts [in the northern hemisphere] where species of *Dermacentor* are the vectors the disease appears from the middle of May to the end of June, and only isolated cases occur in the autumn. In the case of species of *Hyalomma* the imagoes are present throughout the year, so that equine disease may occur at any time. Only one generation of ticks of this genus is produced a year, however, and the adults are thus always less numerous than are adult *Dermacentor*. The same applies to the species of *Rhipicephalus* in Africa. In southern Europe and North Africa the adult *Rhipicephalus* is only active from April to October, so that equine piroplasmosis occurs from spring to autumn inclusive.

It is pointed out that knowledge of tick distribution is not very accurate, but it is thought that this is not very important because when only small numbers of ticks are present in an area, the disease will no longer occur or will be very rare. Although all three genera of ticks have been proved capable of transmitting both piroplasms, it is doubtful whether this occurs in nature. It appears that if only *Dermacentor* are present, only *B. caballi* infection is prominent, and where *Rhipicephalus* and *Hyalomma* occur *B. equi* infection is predominant. If all three genera occur, then *B. caballi* infection predominates in the spring whilst *B. equi* cases occur throughout the year. The question of the extension of the disease to central and western Europe is discussed, and it is considered that such extension is unlikely. [This seems to ignore the occurrence of both *B. caballi* and *B. equi* in France.]—U. F. RICHARDSON.

JESCH, D. (1943). Über Piroplasmose der Pferde. **[Equine piroplasmosis].**—*Z. Veterinärk.* **55.** 70–72. **265**

Observations are recorded on an outbreak of equine piroplasmosis in southeastern Europe, involving 20 horses out of a complement of 850 horses, 130 mules, and 6 donkeys. As the donkeys and mules escaped infection and as the only tick present was *Dermacentor reticulatus*, the disease was ascribed to *Babesia caballi*. The disease only affected German horses, particularly those of heavy breeds. Treatment with acaprin led to the recovery of all but two animals, though in some cases treatment had to be repeated. It was not confirmed that repetition of acaprin treatment within 24 hours is dangerous.

—U. F. RICHARDSON.

*RIMPAU, W. (1942). Eine Einteilung der Leptospirosen. **[The pathogenic leptospira].**—*Klin. Wschr.* **21.** 342. [Abst. from abst. in *Dtsch. tropenmed. Z.* **47.** 369]. **266**

The grouping of leptospira according to their ability to cause jaundice, their reservoir hosts, and their serological characters is discussed. It is pointed out that the relationships revealed by the last are not always correlated with the clinical symptoms caused in human beings.—U. F. RICHARDSON.

*MINO, P. (1942). Zur Epidemiologie der Leptospirosen. **[The epidemiology of leptospiroses].**—*Klin. Wschr.* **21.** 337. [Abst. from abst. in *Dtsch. tropenmed. Z.* **47.** 369]. **267**

The types of leptospira harboured by mice and rats in rice fields are discussed, the occurrence of human leptospirosis being ascribed to the habits of these rodents and the excretion of leptospira in their urine.

—U. F. RICHARDSON.

*RIMPAU, W. (1943). Systematische Untersuchungen von Feldmäusen auf Leptospiren. **[Leptospira infection in field mice].**—*Münch. med. Wschr.*

90. 48. [Abst. from abst. in *Dtsch. tropenmed. Z.* **47.** 370]. **268**

In an investigation of the prevalence of leptospirosis in mice in Bavaria it was found that in some places 30% of field mice carried *Leptospira grippo-typhosa*, and a wood mouse (*Apodemus sylvaticus*) was found to harbour *L. sejro*. It is concluded that, in view of the numerous areas from which mouse leptospirosis has been recorded, it must be presumed to be prevalent throughout Europe, and that mice as well as rats must be considered to be the reservoir hosts of these organisms. Whilst some species of mice appear to harbour only one species of *Leptospira*, other species seem capable of harbouring several different types of these organisms.—U. F. R.

*Schüffner, W., & Bohlander, H. (1942). Klinische und bakteriologische Beobachtung einer Laboratoriumsinfektion mit Schlammfieber. Anhaltende Leptospirurie. [**Laboratory infection with** *Leptospira grippo-typhosa*].—*Zbl. Bakt. I.* (*Orig.*). **149.** 193. [Abst. from abst. in *Dtsch. tropenmed. Z.* **47.** 371]. **269**

Observations are recorded on a case of *L. grippo-typhosa* infection contracted in the laboratory through the bite of an infected mouse. The disease commenced 11 days after the bite. Leptospira were demonstrated in the blood of the patient, and could be recovered from the urine for 2½ months. The blood picture was characterized by severe monocytosis.—U. F. R.

Larson, C. L. (1944). **Experimental leptospirosis in hamsters** (*Cricetus auratus*).—*Publ. Hlth Rep., Wash.* **59.** 522–527. **270**

Golden hamsters (*Cricetus auratus*) were found to be susceptible to *Leptospira canicola*, dying in 4–10 days after intraperitoneal inoculation, with an average of 6 days. Autopsy revealed haemorrhages in the lungs, and organisms could be detected in the peritoneal fluid. With this more sensitive animal it may be possible to isolate the organism with greater frequency than has previously been the case. Whilst *L. icterohaemorrhagiae* kills g. pigs, mice, and hamsters, *L. canicola* kills hamsters, but only produces a febrile reaction with loss of weight in g. pigs, and fails to infect mice.

Specific anti-*canicola* rabbit serum was found to protect hamsters against infection, and proved of value as a therapeutic agent if used within three days of infection.—U. F. Richardson.

*Hallauer, C., & Kuhn, H. (1942). Dauerpassagen von Leptospira icterogenes und Spirochaeta pallida (Truffi) im Hühnerembryo. [**Long passage of** *L. icterohaemorrhagiae* **and** *Treponema pallidum* **in fowl embryos**].—*Z. Hyg. InfektKr.* **124.** 125. [Abst. from abst. in *Dtsch. tropenmed. Z.* **47.** 369]. **271**

A strain of *L. icterohaemorrhagiae* was maintained through 15 passages over a period of 60 days in fowl embryos incubated at 30°C. The organisms could be regularly demonstrated in the blood and liver of the embryo, the infection disappearing in 5–7 days with the death of the embryo. The pathogenicity for g. pigs of the passaged organisms remained constant. A strain of the human syphilis spirochaete was also cultivated in embryo chickens without loss of pathogenicity to the rabbit. The rabbit could be infected by inoculation of embryo liver infusion, although no typical spirochaetes could be detected in liver sections. *T. pallidum* infection of the embryo chick is clinically latent, but persists for the whole period of incubation.—U. F. Richardson.

See also. abst. **388** (trypanosomiasis and piroplasmosis).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Cooke, B. T., Hurst, E. W., & Swan, C. (1942). **Routes of entry into the nervous system of viruses introduced into the bloodstream. Experiments with the viruses of pseudorabies, herpes and infectious myxomatosis.**—*Aust. J. exp. Biol. med. Sci.* **20.** 129–138. **272**

In order to determine the route of entry of viruses into the central nervous system, rabbits were injected intravenously or intra-arterially (carotid) with various viruses, with or without drugs known to increase the permeability of the blood-brain barrier, and with or without the production of intravascular emboli (by inclusion of fungous spores or oil emulsion). At intervals, organs were examined for the presence of virus after thorough vascular perfusion to remove blood. It was concluded that the viruses of herpes and of pseudorabies [Aujeszky's disease] first infect the viscera and from these ascend to the dorsal cord and thence to other parts of the c.n.s., although it is possible that virus may occasionally reach the olfactory bulbs from the nose. Myxomatosis virus reaches the c.n.s. from the bloodstream. The drugs used had no facilitating effect. Emboli greatly increased primary encephalitic infection set up by minimal doses of herpes virus.

—A. W. Turner (Australia).

Hofmann, W. (1944). Seröse Hepatitis bei akuter Maul- und Klauenseuche. [**Serous hepatitis in acute foot and mouth disease**].—*Z. InfektKr. Haustiere.* **60.** 277–286. **273**

Cattle slaughtered soon after infection with F. & M. disease virus, for the purpose of providing infective material for vaccine production, were found in many cases to show some abnormality of the liver. The results are given of a systematic macroscopic and microscopic examination of 31 livers from animals artificially infected with the stock O type strain. Fifteen were from cattle killed 24 hours after infection, 3, 3 days, 3, 6 days, 2, 9 days, 4, 37 days, and 4, 56 days after infection. Two-thirds of the livers of those animals killed after 24 hours and all of those killed after 3 and 6 days showed some degree of serous hepatitis. The livers of the animals killed after 9, 37, and 56 days showed no abnormality.

The opinion is expressed that this involvement of the liver is not due to any specific action of the virus but is part of the general reaction to the infection and that those animals which showed no abnormality of the liver when killed 24 hours after infection had not had time to develop the disease.—W. M. Henderson.

Möhlmann, H. (1944). Untersuchungen über die komplementbindenden Substanzen bei der Maul- und Klauenseuche. [**Complement-fixation test in foot and mouth disease**].—*Z. InfektKr. Haustiere.* **60.** 324–331. **274**

By 3½ hours' ultracentrifugation at 30,000 r.p.m. of fresh bovine vesicle lymph, the virus content of the supernatant fluid was reduced to $\frac{1}{100,000}$ while the complement-fixing antigen content was reduced only to $\frac{1}{8}$. In the same way it was found that the immunizing capacity of a vaccine could be reduced in the supernatant fluid more rapidly than the c.-f. antigen content. From this it is assumed that the c.-f. antigen is not identical with active virus or the immunizing antigen. A study of suspensions of bovine epithelium before ultracentrifugation showed a possible correlation between the virus titre and the c.-f. antigen content,

and the tentative suggestion is made that the c.-f. test could be used to indicate the potency of such a suspension and its value for vaccine production. Titration of the virus-neutralizing antibody and the c.-f. antibody in serum from cattle recovered from the disease indicated that the antibodies were distinct; the period during which detection of the c.-f. antibody was possible was shorter than that in which virus-neutralizing antibody could be detected.—W. M. HENDERSON.

*BIRCHER, E. (1943). Bemerkungen zur Maul- und Klauenseuche beim Menschen. **[Foot and mouth disease in human beings].**—*Münch. med. Wschr.* p. 359. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 342]. 275

It is stated that, in 1869, typical symptoms of F. & M. disease appeared in the mouth of a human being whose mouth had been rubbed with saliva from an infected ox.—W. M. HENDERSON.

—. (1943). **Report of the committee on rabies [U.S. Live Stock Sanitary Association].**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 243–247. 276

During the year 1941 there were 7,877 cases of rabies in the U.S.A., 6,648 in dogs, 418 in cattle, 39 in horses, 68 in sheep, 159 in pigs, 294 in cats, 9 in goats, 30 in man, and 212 miscellaneous cases. Consideration is given to the possibility of transmission of rabies by milk. In several cases rabies virus has been reported in milk and in udder tissues, but such an occurrence is rare and little danger is thought to exist from the consumption of milk from even a rabid animal. Milk from a rabid cow should, however, be condemned as unfit for consumption.—D. D. OGILVIE.

*BOBES, S. (1938). Prophylaxie générale de la rage en Roumanie. I. La rage en Roumanie au 19e siècle. **[Rabies prophylaxis in Rumania. I. Nineteenth century].**—*Anal. Inst. Victor Babes, Bucarest.* **9.** 11–34. [Abst. from abst. in *Bull. Inst. Pasteur.* **42.** 20]. 277

A general discussion on areas of endemic rabies infection in Rumania, together with suggestions concerning its control in such areas. About 20,000 persons are treated annually in Rumania.

*JONNESCO, D. (1938). Cinquante années de vaccinations antirabiques à l'Institut " Dr. Victor Babes ". **[Fifty years of rabies vaccination at the Babes Institute].**—*Anal. Inst. Victor Babes, Bucarest.* **9.** 89–105. [Abst. from abst. in *Bull. Inst. Pasteur.* **42.** 24]. 278

During the 50 years, 134,090 persons were treated, with a mortality of 0·27%.

*BUJIWID, O. (1938). Les premières étapes de la méthode Pasteur et l'origine des établissements pour les inoculations antirabiques à Varsovie et Cracovie. **[History of rabies inoculation in Poland].**—*Anal. Inst. Victor Babes, Bucarest.* **9.** 39–40. [Abst. from abst. in *Bull. Inst. Pasteur.* **42.** 24]. 279

A historical note.

HENLE, W., HENLE, G., GROUPÉ, V., & CHAMBERS, L. A. (1944). **Studies on complement fixation with the viruses of influenza.**—*J. Immunol.* **48.** 163–180. 280

A number of sedimentation experiments on influenza viruses A and B present in the allantoic fluid of chick embryos (high speed centrifugation at 90,000 × gravity for 60–90 min.) showed that viral activity was practically completely removed from the supernatant, whereas only a part of the complement-fixing antigen was sedimentable: the non-sedimentable fraction tended to increase proportionately with the period of incubation of the eggs. Similarly, practically all the infected particles were adsorbed on chick red cells, mouse lung etc., whereas the complement-fixing antigen was only partly affected.

Two types of antigen capable of fixing complement seemed to be revealed by these tests. Both showed the phenomenon of zonal reactions, but the optimum dilutions varied according to the preparations employed. Further trials indicated, however, that only one serum-antibody reaction was involved. The authors consider that the phenomenon of an apparent duality of specific antigen may be attributable to the production of degradation products which interfere with complement fixation.—R. E. GLOVER.

FRIEDEWALD, W. F. (1944). **Qualitative differences in the antigenic composition of influenza A virus strains.**—*J. exp. Med.* **79.** 633–647. 281

Antigenic differences amongst strains of influenza virus were demonstrated by neutralization, haemagglutinin, and complement-fixation tests on absorbed ferret and human antisera. The immune sera, suitably diluted, were absorbed with egg-propagated virus, preferably concentrated, at 37°C. for 30 min., followed by 18 hours at 4°C. They were then spun at 11,000 r.p.m. in the angle centrifuge and filtered through two membranes of 600 mμ and 100 mμ average pore diameter respectively. These absorption tests revealed a complete difference between A and B viruses and a high degree of specificity of the PR8, WS, and swine strains. In general, practically all the antibody in each serum was removed only by the homologous virus strain. The amount of heterologous antibody remaining varied inversely as the concentration of virus used for absorption. Within the influenza A group, related strains differed from PR8 in that each absorbed completely only those heterologous antibodies which reacted with the absorbing strain, with the possible exception of swine virus. Fairly low concentrations of virus removed more neutralizing antibodies (80%) than agglutinins (50%) or complement-fixing antibodies (25%).

Similar results were obtained with a human convalescent serum.—R. E. GLOVER.

I. BURNET, F. M. (1942). **Discontinuous variation in influenza virus.**—*Aust. J. Sci.* **5.** 81–83. 282

II. BURNET, F. M., & BULL, D. R. (1943). **Changes in influenza virus associated with adaptation to passage in chick embryos.**—*Aust. J. exp. Biol. med. Sci.* **21.** 55–69. 283

I. & II. Freshly isolated strains of influenza virus, in the form of amniotic fluid of chick embryos infected directly with throat washings, agglutinate the red cells of the g. pig to a higher titre than those of the fowl, the fowl : g. pig (F : G) ratio being less than 0·25; they also fail to multiply in the allantoic cavity, produce excess fluid when inoculated into the amniotic cavity, have little activity in immunizing mice when given intranasally, and their haemagglutinating activity is not inhibited by human tears. Such strains are referred to as original (O) type. On the other hand, after 2–3 normal passages through chick embryos, during which the strains become " adapted ", their F : G ratio becomes greater than 0·5, they multiply freely in the allantoic cavity, diminish the fluid in the amniotic cavity, immunize mice readily, and their haemagglutinating activity is readily inhibited by human tears. Such strains are referred to as derivative (D) type. If, however, passages are carried out with minimal infecting dilutions of amniotic virus, strains can be maintained in the O type. It is considered (a) that the O → D change is a discontinuous variation, (b) that mutation takes place perhaps once in every 10^5 or 10^6 replications, (c) that D type, being better adapted to the chick and

the mouse, quickly overgrows the O type in them, whereas O type has some specific character favouring its survival in man. These observations and deductions are based mainly on the behaviour of one strain of influenza A virus.—A. W. TURNER (AUSTRALIA).

TAYLOR, A. R., SHARP, D. G., MCLEAN, I. W., Jr., BEARD, D., & BEARD, J. W. (1944). **The relation of viral concentration to the infectivity for chick embryos of influenza virus B (Lee strain).**—*J. Immunol.* **48.** 191–197. **284**

In order to determine whether variations in the amount of inoculum introduced into the developing egg would influence subsequent infection, titrations were made with purified influenza virus B, the same quantity of virus being used in volumes varying from 0·001–1·024 ml. Chorio-allantoic fluid was subsequently withdrawn from each egg and was titrated for viral activity by the Hirst test. The data were plotted in the form of the logarithm of viral nitrogen per ml. of inoculum, and the logarithm of volume of inoculum. The results showed that the relation between virus concentration and volume was linear, the lines being drawn by the method of least squares. It is concluded that infectivity is practically uninfluenced by the volume of fluid inoculated into the egg.

—R. E. GLOVER.

KNIGHT, C. A. (1944). **A sedimentable component of allantoic fluid and its relationship to influenza viruses.**—*J. exp. Med.* **80.** 83–100. **285**

High-speed centrifugation of normal allantoic fluid from eggs incubated for 10–14 days yielded a sedimentable protein fraction smaller in amount than that obtained from fluids infected with PR8 virus and subjected to the same process. This fraction showed some red cell agglutinin activity, was unaffected by freezing and thawing, and had a sedimentation constant which varied according to the concentration. Electron micrographs indicated that 80% of the particles measured about 40 mμ as compared with 100 mμ for influenza virus particles. Antisera prepared in rabbits injected with sedimentable protein of normal allantoic fluid gave a precipitin reaction not only with homologous antigen but also with purified influenza A and B viruses. This reaction is attributed to a normal protein fraction in the latter, since adsorption of an anti-PR8 serum with normal protein removed the normal precipitin, leaving the specific precipitin unchanged.

K. suggests that normal protein elements form a part of the virus particle. The importance of these findings for the chemical analysis of virus preparations is considered.—R. E. GLOVER.

REEVES, W. C., & HAMMON, W. MCD. (1944). **Feeding habits of the proven and possible mosquito vectors of Western equine and St. Louis encephalitis in the Yakima Valley, Washington.**—*Amer. J. trop. Med.* **24.** 131–134. **286**

Precipitin tests on the blood from 788 engorged female mosquitoes caught in the wild state showed that 209 had fed on fowls. Of these, 158 were *Culex tarsalis* and 40 were *C. pipiens*. Since these two species are probably the chief vectors of E.E. in the Yakima Valley, the authors conclude that the domestic fowl is an important reservoir of infection.—G. B. S. HEATH.

BEJARANO, J. F. R. (1942). Encefalitis humana de origen equino. La encefalitis cordobesa de Valdez]. **[Human encephalitis of equine origin].**—*1er. Congr. nac. Enferm. endem.-epidem., B. Aires, 1942.* pp. 328–332. **287**

Although equine encephalomyelitis occurs in Santa Fé, and the recognized vectors are present, the human population seems to be free from the infection. Cases of encephalitis in man, said to have been of equine origin, were reported by VALDEZ in Cordoba, Argentina, but investigations showed that they were unrelated to E.E. : it is suggested that these cases form a new entity.—ISOBEL W. BROCKLEHURST.

CASALS, J., & SCHNEIDER, H. A. (1943). **Natural resistance and susceptibility to Russian spring-summer encephalitis in mice.**—*Proc. Soc. exp. Biol., N.Y.* **54.** 201–202. [See also *V. B.* **14.** 233, abst. 1487]. **288**

WEBSTER [*V. B.* **5.** 506, and **8.** 25.] described four strains of inbred mice with different susceptibilities and resistances to certain viruses on the one hand and to bacterial infections on the other. Two of these strains were found to be resistant to the virus of louping-ill, whereas the others were fully susceptible.

C. made further tests using the virus of Russian spring-summer encephalitis, which has a close affinity with louping-ill virus. He found that the two stocks resistant to louping-ill are also resistant to the Russian encephalitis virus.—R. E. GLOVER.

KULENKAMPFF, G. (1943). Der heutige Stand der Pferdesterbeimmunisierung mit Mäusepassagevirus. **[The present position regarding immunization against African horse sickness with the mouse-passaged virus].**—*Dtsch. tropenmed. Z.* **47.** 338–346. **289**

The method is reviewed of immunizing horses against horse sickness by virus passaged intracerebrally in mice ; it is pointed out that the virus is not neurotropic in horses and that it appears in the blood of animals undergoing immunization. Although the passaged virus appears to retain the characters of the mouse virus, immunization should not be carried out in a country free from horse sickness, in view of the danger of its reversion to an equine type virus. K. claims to have succeeded in infecting mice by intranasal administration of the virus, and also by inhalation, and suggests that this may simplify the process of vaccine preparation.

—U. F. RICHARDSON.

DE BRITO GUTERRES, J. (1942). A snotsieke ou a febre mucosa africana, em terras de Gaza. **[Bovine malignant catarrh in Gaza, Portuguese East Africa].**—*Rev. Med. vet., Lisboa.* **37.** 37–46. **290**

This is an account of an outbreak of bovine malignant catarrh, in cattle ranging in age from six months to five years. It was suspected that infection was transmitted to the cattle from neighbouring sheep, which showed symptoms resembling those of the bovine condition. In support of this view, it was noticed that bovine cases ceased to occur when the cattle were put on new pasture and kept apart from the sheep. Transmission experiments proved inconclusive.

—ISOBEL W. BROCKLEHURST.

BURNET, F. M. (1942). **The affinity of Newcastle disease virus to the influenza virus group.**—*Aust. J. exp. Biol. med. Sci.* **20.** 81–88. **291**

B. discusses (a) the similarity between Newcastle disease virus and well-adapted strains of influenza virus after inoculation by various routes in the chick embryo, (b) the similarity of particle size (80–120 mμ), (c) the route of infection in the adult host (upper respiratory tract), and (d) the partial correspondence in the range of red cell species agglutinated by the two viruses. He considers the viruses to be rather closely related although there is no serological relationship between them. He suggests that they may have a more or less remote common ancestor.—A. W. TURNER (AUSTRALIA).

TOOMEY, J. A., TAKACS, W. S., & TISCHER, L. A. (1943). **Attempts to recover poliomyelitis virus from fruit, well water, chicken cords, and dog stools.**—*J. Pediat.* **23.** 168–171. **292**

Attempts were made to recover the virus of poliomyelitis from fruit, well water, the spinal cords of chickens with paralytic disease [no details given], and the faeces of sick dogs [no details] in areas in which human poliomyelitis had occurred. Suspensions of these materials were inoculated into monkeys and eastern cotton rats, but the virus could not be demonstrated.—G. J.

Eaton, M. D., Meiklejohn, G., & van Herick, W. (1944). **Studies on the etiology of primary atypical pneumonia. A filterable agent transmissible to cotton rats, hamsters, and chick embryos.**—*J. exp. Med.* **79.** 649–668. [Authors' summary copied *verbatim*]. **293**

1. A filterable virus from certain cases of primary atypical pneumonia was transmitted to chick embryos by inoculation into the amnion of suspensions of bacteriologically sterile lung tissue or filtered sputum, and three strains were adapted by passage.

2. After intranasal inoculation into cotton rats or hamsters, suspensions of the infected chick embryo tissues produced pulmonary lesions which were similar to those seen after instillation of infective human material.

3. The agent propagated in chick embryos was specifically neutralizable by serum from patients recovered from primary atypical pneumonia and was not neutralized by the acute-phase specimens.

4. Passages of the virus in cotton rats and hamsters gave confusing results because of contamination with latent respiratory agents already present in the animals.

Meiklejohn, G. (1943). **The cold agglutination test in the diagnosis of primary atypical pneumonia.**—*Proc. Soc. exp. Biol., N.Y.* **54.** 181–184. [See also *V. B.* **13.** 388]. **294**

Sera from 60 out of 74 patients diagnosed clinically as cases of primary atypical pneumonia, showed cold agglutinins in dilutions of 1 : 20 and over (maximum 2,560), whereas out of 133 control sera, 126 were below 1 : 10 and the remaining seven fell between 1 : 10 and 1 : 20. The significance of these results is discussed. —R. E. Glover.

*Wehrlin, H. (1940). Die Schweinehüter-Krankheit (Meningitis serosa porcinarii, Maladie des porchers). **[Swineherds' disease]**.—*Ergebn. inn. Med. Kinderheilk.* **58.** Berlin : Julius Springer. [Abst. from review in *Schweiz. Arch. Tierheilk.* 84. 77–81]. **295**

A useful monograph giving a comprehensive review of the disease in man and the associated condition in pigs with a study of 11 human cases observed by W.; findings in these cases agreed with those of other workers. To avoid confusion in nomenclature, W. agrees with Gsell [*V. B.* **11.** 858.] that the special designation "meningitis serosa porcinarii" should be used in addition to the name "swineherds' disease". No new information is presented, but a very full description is given of all aspects of the condition. —W. M. Henderson.

Spuhler, V. (1942). Bemerkungen zur "Maladie des porchers". **[Notes on swineherds' disease]**.—*Schweiz. Arch. Tierheilk.* **84.** 276–279. **296**

S. emphasizes the importance of the investigation of disease in animals in the elucidation of the recognized virus diseases which affect both man and animals; he considers that the complex problem of the epidemiology, epizoology, and pathology of swineherds' disease will be solved only if the veterinarian fully co-operates with medical workers by investigating the associated disease in pigs and by reporting human cases which he may meet in his visits to infected premises. No new information about the disease is recorded.—W. M. H.

See also absts. **413** (equine encephalomyelitis), **417, 418** (rinderpest), **288** (louping-ill), **317** (avian lymphomatosis), **318** (rabbit papilloma), **324-327** (infective hepatitis), **297, 298** (red cell agglutination by viruses).

IMMUNITY

I. Burnet, F. M. (1942). **Red cell agglutination by viruses: the Hirst phenomenon.**—*Aust. J. Sci.* **5.** 5–7. **297**

II. Clark, E., & Nagler, F. P. O. (1943). **Haemagglutination by viruses. The range of susceptible cells with special reference to agglutination by vaccinia virus.**—*Aust. J. exp. Biol. med. Sci.* **21.** 103–106. **298**

I. A general article on the Hirst phenomenon, in which are described recent applications and extensions by workers at the Hall Institute, Melbourne; most of these have appeared or are about to appear as separate contributions to the literature.

II. One of the papers referred to in I. The range of species giving red cells agglutinated by influenza, Newcastle disease, and vaccinia viruses was determined. Influenza and Newcastle disease viruses show general resemblances in agglutinative behaviour, but can be divided into three groups containing (a) the three influenza A strains, (b) influenza B virus, and (c) Newcastle disease virus. Of the species tested only fowl, g. pig, and human cells are likely to be of value for work with these viruses. Vaccinia agglutinates susceptible fowl cells to high titre, but has only a low-grade action on red cells of any of the other species tested. About 50% of fowls of six months of age and over give red cells agglutinable by vaccinia, and this appears to be a genetic characteristic unrelated to age, sex, or breed. Agglutinability develops within 2–4 weeks after hatching.—A. W. Turner (Australia).

Zahl, P. A., Hutner, S. H., & Cooper, F. S. (1943). **Action of bacterial toxins on tumors. V. Immunological protection against tumor hemorrhage. VI. Protection against tumor hemorrhage following heterologous immunization.**—*Proc. Soc. exp. Biol., N.Y.* **54.** 48–50, & 187–189. [For previous parts, see *V. B.* **14.** 96]. **299**

V. Many bacterial toxins induce haemorrhage in grafted tumours in mice. Mice can be immunized against the lethal action of the toxins by repeated administration of small doses of toxin. Tumours in mice immunized in this way are more resistant to the haemorrhagic action than are similar tumours in normal mice. The haemorrhagic factor is present in many Gram-negative bacteria and is possibly related to the O antigens.

VI. Immunization of mice against toxins of *Bacterium flexneri, Salmonella typhi-murium,* and *Rhodospirillum rubrum* protected the animals against the induction of haemorrhage in tumours by these toxins. Immunization with any one of the toxins protected the tumours against the haemorrhagic action of the other toxins.—E. Boyland.

Zahl, P. A., & Hutner, S. H. (1944). **Protection against the endotoxins of some Gram-negative bacteria conferred by immunization with heterologous organisms.**—*Amer. J. Hyg.* **39.** 189–196. **300**

A study of the protection against lethal effects of the endotoxins of *Salmonella typhi-murium, Bacterium flexneri,* and *Rhodospirillum rubrum.* Earlier work [*V. B.* **13.** 176.] has shown that nearly all Gram-

negative organisms display a common pattern of toxicity, characterized by vascular damage, which is easily demonstrable by the induction of haemorrhage in transplanted tumours. The three organisms used for the present work were chosen on the basis that none possessed a specific O or H antigen shared by the other two. Toxin was prepared by growing the organisms on liquid media, concentrating the liquid by evaporation through cellulose tubing, and drying the residue with acetone and ether. Dose-survival curves for each were obtained by the intraperitoneal injection of mice.

Groups of 100 mice were immunized by intraperitoneal injection of increasing doses of toxin from 0·25 L.D.50 to 2 L.D.50; the degree of immunity of the survivors (70–90%) was then tested by the injection of a 4 L.D.50 dose of the homologous or the heterologous material. Results of three separate experiments showed the homologous protection to be 77%, 83%, and 53% respectively for *R. rubrum*, *S. typhi-murium*, and *Bact. flexneri*; the percentage survival of immunized mice to heterologous injections varied from 32–75%, compared with 3–10% in unimmunized mice. As it was recognized that the method of preparation of endotoxin yielded a crude product, the experiments were repeated with similar results with a trichloracetic acid extract.

To account for this type of cross-immunity the hypothesis is advanced that a common toxic factor may exist as a widely distributed antigenic substratum of Gram-negative bacteria.—W. M. Henderson.

Potter, T. S. (1943). **Use of bacterial asphyxia for homologous antigen production in experimental immunization against human-type tuberculosis.**—*Proc. Soc. exp. Biol., N.Y.* **54.** 143–145. [See also *V. B.* **14.** 79]. **301**

The contents of tubes containing human type tubercle bacilli in a de-oxygenated, water vapour saturated atmosphere were found to be completely sterile after incubation at 40°C. for one month. The "asphyxiated" organisms possessed very considerable immunizing properties and, when used in the form of multiple subcutaneous injections, were capable of protecting rabbits against infection with intravenously injected virulent human type bacilli. The doses of vaccine employed (78 mg.) were about 30 times larger than the doses of heat-killed vaccine used by Opie & Freund [*V. B.* **8.** 688.] and about 300 times greater than the clinically advisable doses of BCG. The human infecting strain was less virulent than Opie and Freund's Ravenel bovine strain, but the test doses (0·1–0·5 mg.) were approximately 10,000 times as great and the protection obtained was apparently more complete.

G. pigs were also protected by the "asphyxiated" bacilli, but less completely than were rabbits and less efficaciously than with equal doses of BCG.

—J. Lochiel McGirr.

Freund, J., & Walter, A. W. (1944). **Saprophytic acidfast bacilli and paraffin oil as adjuvants in immunization.**—*Proc. Soc. exp. Biol., N.Y.* **56.** 47–50. **302**

The subcutaneous injection of an emulsion of horse serum in "falba" [a commercial lanolin-like substance] and liquid paraffin induced more effective antibody formation in g. pigs than did horse serum alone: a striking additional enhancement of antibody formation was produced by the incorporation of killed timothy grass bacilli in the emulsion, the effect being almost as great as that produced by killed tubercle bacilli [see Freund *et al.* (1942). *Proc. Soc. exp. Biol., N.Y.* **49.** 548]. Skin sensitivity to horse serum was practically unaffected by the presence of the "falba" and liquid paraffin but, under the conditions of these studies, the injection of the killed timothy grass bacilli induced a considerable degree of sensitivity to tuberculin.

—J. Lochiel McGirr.

Freund, J., & Bonanto, M. V. (1944). **The effect of paraffin oil, lanolin-like substances and killed tubercle bacilli on immunization with diphtheric toxoid and Bact. typhosum.**—*J. Immunol.* **48.** 325–334. **303**

Water-in-oil emulsions of *Corynebacterium diphtheriae* toxoid and killed typhoid bacilli were separately tested in rabbits to determine their efficiency as antigens. A soft fat marketed under the name of Eucerin or Aquaphor was the main agent used to delay the absorption of the two spaced subcutaneous injections. The effect of the further addition to the injections of liquid paraffin and killed tubercle bacilli was also studied. The antitoxin response following the use of the diphtheria toxoid plus the lanolin-like substance was higher and also markedly prolonged as compared with the response to plain or alum diphtheria toxoid. The use of killed tubercle bacilli and liquid paraffin did not further improve the antigenicity. In the experiments with the formalin-killed typhoid bacilli, the value of a fatty base was even more clearly shown. The agglutinin response was greatly enhanced and it persisted at a high level until the conclusion of the work at the end of 17 months. Liquid paraffin and killed tubercle bacilli further improved the antigenicity of the emulsion of typhoid bacilli. The use of fatty bases may be accompanied by slight nodule formation and brief mention is made of a persistent tissue reaction following the injection of liquid paraffin.—J. Keppie.

Petherick, M. H. (1942). **Studies on natural resistance. I. The relative resistance of guinea-pigs and mice to diphtheria toxin.**—*Aust. J. exp. Biol. med. Sci.* **20.** 263–272. **304**

The fatal dose of diphtheria toxin for the mouse is 85 to more than 170 times greater than that for the g. pig, according to the route of infection (weight for weight these figures should be multiplied by about 12, *i.e.* approximately 1,000–2,000), whereas the skin-reacting dose is at least 20,000 times greater. It was shown that mice excreted intravenously injected toxin in their urine mostly in the first few hours, whereas g. pigs excreted up to the time of death and excreted a larger proportion than did mice, but in each case only a small proportion was excreted (maximum for mice, 1·3% and for g. pigs 4·1%). Within a short time (about four hours), most of the toxin had disappeared from the blood serum and could no longer be demonstrated in extracts of organs, and it is suggested that a special type of mechanism, with a long latent period, is responsible for the binding or destruction of the toxin in the organs. Intradermally injected toxin disappeared slightly more quickly from the skin of the mouse than of the g. pig.

—A. W. Turner (Australia).

Moloney, P. J., & Hennessy, J. N. (1944). **Titration of tetanal toxins and toxoids by flocculation.**—*J. Immunol.* **48.** 345–354. **305**

M. explains the occurrence of false zones of flocculation in tests with tetanus toxin and antitoxin, and describes in detail how an antiserum may be prepared in which the only flocculating antibody is antitoxin. A large number of tetanus toxins all derived from a single strain were examined and the ratio of Lf : M.L.D. was in the majority of cases about 1 : 10,000. True toxin-antitoxin flocculation was recognized by the following criteria :– (1) the contents of the first tube to show flocculation were neutral, *i.e.* harmless in mice : (2) the combining values from the flocculation tests and parallel

animal tests were in agreement: (3) true floccules after washing could absorb toxin and antitoxin; (4) antitoxin could be extracted from true floccules. The second of the above tests was the most generally useful. False Lf values in some cases were shown to be due to an antigen which was more heat-stable than the toxin. Further investigation revealed that false flocculation was also caused by another antigen which was as heat-labile as true toxin and which was slightly less stable towards phenol. When the antibodies to the heat-stable and heat-labile antigens were removed from the test antiserum, it flocculated in a single zone, and proved suitable for determining the flocculating value of tetanus toxins and toxoids.—J. KEPPIE.

VYGODCHIKOV, G. V. (1942). Uspekhi v oblasti izgotovleniya lechebnykh syvorotok za 25 let. **[Twenty-five years' production of antisera].**—*Zh. Mikrobiol., Moscow.* No. 11/12. pp. 90–94. **306**

During the past 25 years in the U.S.S.R. there has been a considerable increase and improvement in the production of antisera against toxins, bacteria, viruses, and snake and spider venoms. It was found that tetanus antiserum of high potency could be prepared relatively quickly by using an "old culture" as antigen, by modification of the substrate, by giving the serum-producing horses a preliminary dose of tetanus toxoid 6–12 months before the main immunizing injections are given, and also by giving nonspecific stimulants. By the use of the new method of reinjection of red blood corpuscles, to prevent anaemia due to bleedings, and by modifying the method of hyperimmunization, an increase in serum yield and a decrease in losses among serum producers was achieved.—A. MOLDAWSKY.

See also absts. **250** (immunization against swine erysipelas), **289** (against African horse sickness), **274** (c.-f. test in foot and mouth disease), **280** (in influenza), **281** (influenza antigens), **321**, **322** (aggln. test in swine brucellosis), **294** (cold aggln. test in atypical pneumonia), **261** (normal serum agglutinins for *Trichomonas foetus*), **326** (heterogenetic antibodies in infective hepatitis), **378** (phagocytosis), **377** (sulphonamides and immune bodies), **359** (immunological study of thyroid).

PARASITES IN RELATION TO DISEASE [GENERAL]

RAO, M. A. N. (1944). **Notes of parasitological interest.**—*Indian J. vet. Sci.* **13.** 178–179. **307**

R. records *Schistosoma suis* from a dog, trypanosomes in skin lesions of cattle, ova of *Schistosoma nasalis* in sections of horn growths of bovine animals, a species of *Thelazia* in an epitheliomatous growth on the eyelid of a bullock with microfilariae in the capillaries of the dermis of the healthy portion of the eyelid, and unsheathed microfilariae in skin lesions from several cattle. —H. D. SRIVASTAVA (INDIA).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

SHCHERBATYKH, P. Y. (1941). Zashchita loshadeĭ ot ukusov nasekomymi-gematofagami. **[Protection of horses from horse flies (tabanids)].**—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Diseases of Horses*]. pp. 41–43. **308**

To obtain effective control of tabanids at the height of their season, all the measures available from present knowledge of the biology and ecology of these flies must be used in conjunction. Animals can be protected from attack by the use of various repellents, and by such measures as keeping them in darkened stables during the daytime and letting them out to pasture at night. The flies and their larvae may be controlled by pouring crude petroleum on stagnant waters, by drainage and soil improvement, and by the clearing away of bushes. —A. M.

MATTHYSSE, J. G. (1944). **Biology of the cattle biting louse and notes on cattle sucking lice.**—*J. econ. Ent.* **37.** 436–442. **309**

Sucking lice were reared on isolated tufts of hair on the backs of heifers kept under normal winter barn conditions. *Linognathus vituli* and *Solenoptes capillatus* were found to have an incubation period of 9–13 days. *Haematopinus eurysternus*, on the other hand, had a slightly longer one of 10–16 days. The oviposition rates were 1–2 eggs per day for *H. eurysternus* and *S. capillatus* and one egg per day for *L. vituli*.

The biting cattle louse, *Bovicola bovis*, was artificially reared by feeding it with cattle hair supplemented by brewer's yeast. A temperature of 95°F. with 75–84% relative humidity gave the optimum conditions for rearing. At 100°F. the majority of individuals died in the process of hatching or in the first instar. These observations, in the light of skin temperature records, suggest that on the host the life-history would be as follows:—egg to hatching, 8 days; first instar, 7 days; second instar, 5½ days; third instar, 6 days; pre-oviposition period, 3 days; the complete cycle from egg to egg, 29 days. The oviposition rate was one egg per female every 35 hours. The louse was maintained through two generations with no males in the culture, and only small numbers of males were found in natural infestations. That cattle lice are serious pests only in the winter and early spring months is explained by the fact that the skin temperature in winter was 92°–93°F., whereas in summer exposure to direct sunlight was sufficient to raise it to 125°F. Since the louse was killed if exposed to this temperature for one hour, it appears that it could exist in the summer months only on restricted and shaded areas.

Measurements and photographs of the different stages of *B. bovis* are given.—J. B. CRAGG.

BROWN, J. H. (1944). **The spotted fever and other Albertan ticks.**—*Canad. J. Res.* Sect. D. **22.** 36–51. **310**

Dermacentor andersoni is present in large numbers in southern Alberta. Since 1938, 412 separate collections made in eighteen different districts resulted in 58,534 ticks being caught by "dragging" and 3,851 being taken from host animals. Two collections, one at Manyberries, the other at Lethbridge, yielded ticks infected with the causative organism of Rocky Mountain spotted fever, and sixteen collections made from various districts were positive for *Pasteurella tularensis*. The ticks were more plentiful on the western and southern slopes of small coulees and draws that were well covered with vegetation and had numerous cattle paths. Information is also given on the life history, habits, activity, and ecology of this tick, which is of paramount importance as a known transmitter of Rocky Mountain spotted fever, tularaemia, and human and animal tick paralysis in the province. Nine other species of tick are known to occur in Alberta, but these were not studied in detail.—J. L. BYRNE (CANADA).

SAPRE, S. N. (1944). **Some methods of feeding ticks.** —*Indian J. vet. Sci.* **13.** 175–177. **311**

A discussion on the use of stockings, bags with draw-strings, disc-shaped leather collars, and cloth garments with draw-strings as devices for feeding ticks on large animals. Mention is made of celloidin and of Chatterton's compound for adhesive purposes. A modification of a method proposed by MORTON (1928), including the use of a tin capsule fixed on the body by means of Chatterton's compound, proved most useful. —B. N. SONI (INDIA).

See also absts. **264** (vectors of equine piroplasmosis), **286** (of E.E. and St. Louis encephalitis), **340** (tick susceptibility of imported cattle), **433** (insects of medical importance).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

I. HICKEY, M. D., & HARRIS, J. R. (1944). **Definitive hosts of a species of Diphyllobothrium causing mass infection of trout in reservoirs: preliminary note.** —*Brit. med. J.* Sept. 2nd. 310. **312**

II. UNSWORTH, K. (1944). **Tapeworm in trout. [Correspondence].**—*Ibid.* Sept. 16th. 385. **313**

III. HICKEY, M. D. (1944). **Tapeworm in trout. [Correspondence].**—*Ibid.* Oct. 7th. 482. **314**

I. The authors record the fact that an outbreak of disease in fish in the Dublin area was caused by a heavy infection with plerocercoids of a species of Diphyllobothriidae. They state that in gulls and cormorants, specimens had been found showing all the stages of development between the typical plerocercoid and the fully developed tapeworm, and suggested that these birds were the definitive hosts of the worm, the plerocercoids of which caused the disease in trout.

II. U. states that he had completed the life-cycle of a tapeworm, the plerocercoids of which caused an outbreak of disease in trout in South Wales [see also DUGUID & SHEPPARD—*V. B.* **14.** 418]. Coracidia hatched from eggs obtained from these worms were used to infect *Cyclops*, which in turn were used to infect sticklebacks. A dog was infected both directly by feeding sticklebacks, and after passage of the worm through pike. If this outbreak and the one recorded in I are similar then a low degree of host specificity is shown since both avian and mammalian definitive hosts are involved. It is possible, however, that two species of *Diphyllobothrium* are involved.

III. H. states that gulls and a shag have been infected with tapeworms by feeding plerocercoids obtained from trout. Although the Irish and Welsh outbreaks are similar in that death of trout occurred following heavy infestation with plerocercoids of the family Diphyllobothriidae, it appears probable that different species are involved in the two outbreaks since mammalian hosts have been infected with plerocercoids from the Welsh outbreak and avian hosts with those from the outbreak in Ireland.—T. E. GIBSON.

See also abst. **409** (faecal culture).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

LIPSCHÜTZ, A., BRUZZONE, S., & FUENZALIDA, F. (1943). **Structural characteristics of antifibromatogenic steroids: experiments with acetoxy-pregnenolone.**—*Proc. Soc. exp. Biol., N.Y.* **54.** 303–304. **315**

Progesterone injection prevents the induction of tumours in g. pigs by oestrogens. On the other hand, acetoxypregnenolone appears to have no effect in neutralizing the carcinogenic action of oestradiol. For antifibromatogenic action, a ketonic oxygen atom at C_3 appears to be essential, and generally the active compounds also have progestational activity.—E. B.

ROWNTREE, L. G., & ZIEGLER, W. M. (1943). **Further report on malignancy observed in rats injected with crude ether-extracted wheat germ oil.**—*Proc. Soc. exp. Biol., N.Y.* **54.** 121–123. **316**

R. and his co-workers have induced malignant tumours in 32% of Wistar rats injected with ether-extracted wheat germ oil. [Many workers in other laboratories have tried unsuccessfully to induce tumours with wheat germ oil.]—E. BOYLAND.

WATERS, N. F., & PRICKETT, C. O. (1944). **The development of families of chickens free of lymphomatosis.**—*Poult. Sci.* **23.** 321–333. **317**

An outbreak of lymphomatosis occurring in a number of strains of strictly quarantined White Leghorn pullets, reared upon the same premises from eggs of known ancestry, presented an opportunity for studying the mode or modes of transmission of the disease.

The authors succeeded after several attempts in rearing families free from lymphomatosis. These families were then kept under conditions of strict quarantine and hygiene and no case of the disease occurred. A group of chicks of the same disease-free strain was reared with a mixed population of birds in which the disease was prevalent, and at the end of 300 days there was a 31% total mortality in this group, 28% of deaths being due to lymphomatosis. The total mixed population showed a 17·8% mortality from this condition.

The occurrence of lymphomatosis among each of the original strains and among subsequent populations also incriminates the egg as a means of transmission. This is further confirmed by the observation that families of progeny from certain dams hatched and reared in separate pens in strict isolation showed lymphomatosis at an early age, whilst other families remained free up to 300 days of age.

The authors discuss the source of the original infection, and the possible modes of infection, *viz*, by virus or by the transplantation of neoplastic cells from maternal parent to progeny, and they draw attention to the desirability of further study of the significance of the microscopic lymphoid-like nodules which occur in the tissues of the normal fowl.—J. G. CAMPBELL.

FRIEDEWALD, W. F., & KIDD, J. G. (1944). **The recoverability of virus from papillomas produced therewith in domestic rabbits.**—*J. exp. Med.* **79.** 591–605. [Author's summary copied *verbatim*]. **318**

By preliminary preparation of the skin in ways that render it hyperplastic the presence of infective virus can be demonstrated in extracts of domestic rabbit papillomas which yield no growths when inoculated by the ordinary methods and which for this reason have been supposed to contain no virus. The amount of virus recovered by the method outlined in the present work, however, is small when compared with the yield obtained in most instances from comparable cottontail rabbit papillomas. The yield is greatly influenced not only by the virus strain used to produce the growths

but by the individual rabbit host. Although virus has been obtained from papillomas produced in domestic rabbits by all of the virus strains tested, a total of 21 thus far, only about one-fourth of these strains are readily to be procured again from the growths they cause and the others are demonstrable only in hosts in which the conditions are favorable for reasons unknown.

An experimental comparison of the capacity of suspensions of papilloma tissue from domestic and cottontail rabbits to elicit specific antibodies has shown that the titers attained are approximately proportional to the amount of infective virus demonstrable in the suspensions. The findings as a whole indicate that far less virus exists in infective or antigenic form in the papillomas of domestic rabbits than in those of cottontail rabbits.

See also absts. **272** (rabbit myxoma), **299** (action of toxins on tumours), **421**, **422** (Imperial Cancer Research Fund).

DISEASES, GENERAL

MINGLE, C. K. (1943). **Personal observations on the importance of animal health in the British war effort.**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 19–27. **319**

During an official visit to Britain from the U.S.A. to establish facilities for the production of *Brucella abortus* strain 19 vaccine, M. made personal observations of many wartime activities relating to food production and conservation. He was impressed by the efforts made to expand to the limit home production of foods, by the high level of milk production, and by the successful maintenance of practically pre-war numbers of animals.

M. reviewed the Ministry of Agriculture scheme for the control of diseases of dairy cattle. He found the mastitis position in Britain much the same as that in the U.S.A., but the contagious abortion and sterility positions considerably worse. Dealing with contagious abortion, he considers that MCEWEN'S work has not been sufficiently extensive to permit a true evaluation of his vaccine, and that the necessity of repeated injections suggests a dangerously low potency value for the vaccine.

He considers that the occurrence of other diseases, except foot and mouth disease, approximated to that in the U.S.A. He found, however, that the incidence of the more chronic infections was considerably higher in Britain.

M. also emphasized the importance of collaboration and personal contact between veterinarians in the U.S.A. and in Britain.—D. D. OGILVIE.

—. (1943). **Report of the committee on transmissible diseases of swine [U.S. Live Stock Sanitary Association].**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 34–36. **320**

In general there was an increase in pig diseases during the year. Swine fever continued to be the chief cause of losses and in some areas was particularly severe. Enteric diseases were prevalent, especially around army camps where swill feeding was general. Mange spread in some areas. Brucellosis was not widespread, but its incidence appeared to be increasing. Swine erysipelas was gradually spreading to new areas.

The auction market sales are indicted as the principal route of spread of pig diseases. Under present circumstances it is not possible to inspect them adequately and the position is not likely to improve until after the war.—D. D. OGILVIE.

STEENERSON, T. L. (1943). **Problems in swine practice.**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 37–42. **321**

The problems dealt with are considered under the headings of breeding, feeding, disease, and dissemination of disease. In general, it is considered that the average producer breeds too many sows and that overcrowding and improper feeding are responsible for severe losses of young pigs. Many foods previously adequate in themselves are now seriously deficient in certain elements and the feeding of supplements is generally necessary.

Among diseases, post-natal scours is a constant problem; it is usually due to faulty management. Pig anaemia has ceased to be a cause of much loss because of the general recognition of the necessity of allowing young pigs access to soil. Pig pox, contrary to general opinion, can frequently be the cause of heavy mortality. Internal parasites are of great economic significance. Individual treatment is advocated with oil of chenopodium, castor oil, and linseed oil by stomach tube. Swine erysipelas is increasing yearly in the U.S.A. Correct diagnosis is the principal problem, especially differentiation from swine fever. The latter is readily controlled by serum-virus vaccination; there is a tendency, however, to give too small amounts of serum and this should be avoided. Uncomplicated pneumonia of pigs is often active and widespread; sulphathiazole at the rate of ½ grain per lb. body weight is successful in nearly all cases. Enteric diseases are one of the most serious problems. Over 85% of cases can be prevented or relieved by proper feeding and management. Infectious haemorrhagic dysentery normally causes high mortality. Alkaline and concentrated saline solution given by stomach tube usually effects a cure in treated cases. Brucellosis is at present difficult to control; the agglutination test is useful for detecting herd infection, but not as satisfactory for individual animals.

With regard to dissemination of disease, the lack of any systematic control is deplored and it is suggested that steps should be taken as soon as possible to improve the position.—D. D. OGILVIE.

—. (1943). **Forum on infectious and transmissible diseases of swine.**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 43–66. **322**

The number of sows farrowed in the U.S.A. in the autumn of 1942, was estimated at nearly 6,900,000, an increase of 25% over the number for the autumn of 1941. The U.S. Department of Agriculture reported an average of nine pigs per litter, with the average number reared as 5·5.

Swine fever and swine erysipelas continue to be of major importance. Observations involving over 500 autopsies showed that a large proportion of all cases of bony enlargement and lameness are due to chronic swine erysipelas; a large-scale experiment was in progress to study the efficacy of active immunization against the disease with live culture and serum; early results were promising.

Swine brucellosis is also of considerable importance and causes severe losses in infected herds. The agglutination test in pigs is regarded as being as reliable as in cattle; a titre of about 1 : 1,000 is considered positive. Attempts to immunize pigs against the disease with strain 19 vaccine were not successful. A vaccine prepared from a *Brucella suis* strain of reduced virulence was tested, but results were not available.

Swine pox had recently been shown to be caused

by two types of virus. Transmission of the disease is by means of lice and not by contact between pigs. The disease can thus be controlled by eradication of lice.
—D. D. OGILVIE.

CARPENTER, C. D. (1943). **The veterinarian's responsibility in the poultry war effort.**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 185–188. **323**

The U.S. Department of Agriculture has reported that the poultry mortality for the first six months of 1942 showed a sharp increase over the corresponding period of the previous year. This is considered to be due largely to war-time overcrowding. The role of the veterinarian as an adviser on management, housing, and disease control in poultry is discussed and it is considered that it should be an outstanding one, especially since it is now recognized that if known methods of disease prevention and control were applied to the whole poultry industry, mortality could be reduced by 50%.—D. D. OGILVIE.

—. (1944). **Discussion on infective hepatitis, homologous serum hepatitis and arsenotherapy jaundice.** [Speakers :– MACCALLUM, F. O., MCFARLAN, A. M., MARSHALL, J., BADGER, T. L., SALAMAN, M. H., MACLAGAN, N. F., & LOUTIT, J. F.]—*Proc. R. Soc. Med.* **37.** 449–460. **324**

MACCALLUM reviewed the subject of transmission experiments in animals and man with material from infective hepatitis and homologous serum jaundice. A useful table gives details of the experiments of various workers. A satisfactory experimental animal for the demonstration of the infective agent is not available. It is concluded that the identity of infective hepatitis and homologous serum jaundice must remain an open question.

MCFARLAN mentioned some of the findings in an outbreak of hepatitis following administration of mumps convalescent plasma.

MARSHALL discussed post-arsphenamine jaundice which clinically, biochemically, and pathologically is indistinguishable from infective hepatitis ; its incubation period is about 100 days. He suggested that it arises from a combination of (1) an infective factor introduced by the syringe, (2) dietetic deficiency of protein with emphasis on S-containing amino acids, and (3) arsenic. He considered that its control lies in (1) proper sterilization of syringes in venereal disease clinics, and (2) improvement in diet, particularly in protein.

BADGER discussed the epidemic of hepatitis in the U.S. Army following yellow-fever vaccinations in 1942. Since that epidemic, all yellow-fever vaccine has been prepared without the human serum diluent and no further cases of jaundice have so far been reported.

SALAMAN discussed the influence of the technique of injection upon the incidence of post-arsenical jaundice. A new technique of intravenous injection has been devised, details of which are given.

MACLAGAN referred to the results of applying the serum colloidal gold reaction, which yielded 6% positives in 34 cases of obstructive jaundice, 95·2% positives in 105 cases of infective hepatitis, and 42% positives in 50 cases of post-arsenical hepatitis.

LOUTIT reported results to indicate that 0·1 ml. doses of reconstituted human serum could transmit homologous serum jaundice as easily as transfusions of up to 1,200 ml. of the same material.—A. N. WORDEN.

BRADLEY, W. H., LOUTIT, J. F., & MAUNSELL, K. (1944). **An episode of "homologous serum jaundice".** —*Brit. med. J.* Aug. 26th. 268–269. **325**

This comprises a report from the S.W. London Blood Supply Depot to the Medical Research Council. Homologous serum jaundice occurred in 57% of persons who had received 0·1–1,200 ml. of a particular batch (no. 034) of serum. The severity of the disease was not related to size of dose or route of administration ; one possible contact case occurred. The icterogenic property of the batch of serum was demonstrated by volunteer experiments on four patients with rheumatoid arthritis, in whom it was desired to produce jaundice for therapeutic reasons.

The attack rate is the highest so far recorded in any series of homologous serum jaundice, but it is pointed out that opportunities were particularly good. The disease was not severe.—A. N. WORDEN.

EATON, M. D., MURPHY, W. D., & HANFORD, V. L. (1944). **Heterogenetic antibodies in acute hepatitis.** —*J. exp. Med.* **79.** 539–557. **326**

In the serum from certain cases of acute hepatitis (post-yellow-fever vaccination or epidemic hepatitis), a heterogenetic antibody, showing complement fixation with human liver and agglutination of sheep red blood cells, was detected. The antigen in liver with which it combined was not destroyed even by heating to 90°C. for one hour, although it appeared to be carried down in the particles of coagulated liver protein so that resuspended sediment had to be employed. Antigenic properties were present also in alcoholic extracts of liver.

The presence or otherwise of the antibody in other conditions and the simplification of the serological reaction are being investigated.—A. N. WORDEN.

ANDREWES, C. H. (1944). **Jaundice and the dilution phenomenon. [Correspondence].**—*Lancet.* **247.** 159–160. **327**

A. draws attention to the " dilution phenomenon ", first described in 1928 in connexion with fowl plague, herpes simplex, and vaccinia, and later demonstrated with many other viruses. He suggests that the phenomenon could well account for the very small doses of serum necessary for the transmission of " homologous serum jaundice ", normal serum or plasma acting as diluent permitting reactivation.

A. further suggests that if clinically normal people " carry " an icterogenic virus in their blood, then it is possibly kept under control by antibody which may be effective in very small amounts. In such case, intravenous inoculation of small amounts of serum-virus mixture could produce disease where larger quantities failed to do so.—A. N. WORDEN.

LARSSON, E. L. (1943). Lætaler i svensk låglandsboskap. **[Lethal factors in Swedish Lowland cattle].**— *K. LantbrAkad. Handl., Stockh.* **82.** 229–239. [English summary]. [Abst. in *Anim. Breed. Abstr.* **12.** 17, copied *verbatim.* Signed : C. AUERBACH]. **328**

Four lethal abnormalities are described, each due to the action of a simple recessive gene. Two of them, leglessness (acroteriasis congenita) and hairlessness (hypotrichosis congenita) were discussed from the genitical point of view in 1928 by Wriedt and Mohr, who were able to trace these genes back to two prominent sires. A third and more serious lethal, which may sometimes be fatal even for the mother, is hydrops-foetus (hydrops congenita), discussed by the author in 1935 and later traced back to a Friesian cow as first known carrier in Sweden. In 1941 bulldog calves (achondroplasia recessiva) of the same phenotype as those described by Mohr and Wriedt for the Norwegian Telemark breed occurred on a Swedish farm. A study of the pedigree of these calves enabled the gene to be traced back to one cow. Considering the relatively small number of matings carried out with presumed carriers of the gene it is concluded that at present this

gene is very rare in the breed. The genes for leglessness and hairlessness, on the other hand, are probably carried by a considerable proportion of the registered animals. Very little is known about the frequency of the hydrops gene ; but since homozygotes occur in strains in which a certain amount of inbreeding is carried out anyhow for fixing the high fat content of the milk, it will be relatively easy to discover and cull the heterozygotes.

See also absts. **425-428** (livestock diseases in Bechuanaland), **429** (in Basutoland), **430** (in Trinidad and Tobago), **434** (diseases of poultry), **398** (in Australia), **419, 420** (sheep diseases in Gt. Britain), **420** (false sturdy in sheep), **321, 389** (swine enteritis), **390** (arsenotherapy jaundice).

NUTRITIONAL AND METABOLIC DISORDERS

MORRIS, M. L. (1943). **Wartime nutritional problems confronting the veterinarian.**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 179–184. **329**

As it is believed that the time is approaching when veterinarians will be primarily employed in an advisory and diagnostic capacity, it is considered imperative that their education should keep pace with general developments in the field of biochemistry and nutrition. In order to ensure this the American Veterinary Medical Association has appointed a special committee on nutrition. It is suggested that the sanitary livestock officials should make available through practising veterinarians facilities for the diagnosis of nutritional and infectious diseases of livestock, that an educational programme in diagnosis and treatment of nutritional deficiency diseases of livestock should be formulated, and that all methods of increasing animal production through these means should be explored.—D. D. O.

RAY, S. C. (1942). **Animal nutrition.**—*Ann. Rev. Biochem. Allied Res. India.* **12.** 40–45. **330**

This is a review of articles on animal nutrition and related subjects published during 1941. The topics include :– the carotene, vitamin A, and vitamin C content of cow's milk ; the inability of the microflora of the alimentary tract of calves to synthesize ascorbic acid ; the effect of temperature and duration of heating on the loss of vitamin A activity in ghee-making ; a discussion on tinned milk ; certain suggestions for remedying the serious deficiency of cattle feeds in India ; the digestibility and feeding value of some concentrates and of rice straw ; the value of berseem for milk production and growth ; some factors influencing the composition of berseem ; a discussion on conservation of grass ; the growth-promoting value of various supplements in the diet of chickens ; mineral deficiency in some pastures and the necessity of supplementing the ration from such pastures with mineral mixture ; some nutritional diseases of young calves ; biochemical studies on spontaneous and experimental fluorosis in cattle, and a method for the estimation of uric acid in urine.—R. MUKHERJEE (INDIA).

JOHNSON, S. R. (1944). **Studies with swine on low-manganese rations of natural foodstuffs.**—*J. Anim. Sci.* **3.** 136–142. **331**

Weanling pigs were successfully fattened on diets comprising yellow maize meal, irradiated yeast, brewer's yeast, steamed bone meal, dehydrated lucerne leaf meal, skim-milk powder, meat scrap, and common salt, and containing only 7–10 p.p.m. of Mn. Storage of Mn on such a diet was greater than that previously reported [*V. B.* **11.** 549.] on more simple types of diets low in Mn. There appeared to be a slight beneficial effect from the addition of 200 mg. per kg. of Mn to basal diets containing over 10% total ash.

Reproduction through two generations was satisfactory on a diet of maize, skimmed milk, and vitamin D supplement.—A. N. WORDEN.

BRAUDE, R., KON, S. K., & WHITE, E. G. (1944). **Yeast as a protein supplement for pigs ; further observations on its rachitogenic effect.**—*J. comp. Path.* **54.** 88–96. **332**

In a continuation of earlier experiments [*V. B.* **13.** 295.], it was found that rickets could be prevented in pigs receiving a diet containing 20% yeast, by dosing with either cod liver oil or calciferol so as to provide each animal with 1,190 I.U. of vitamin D daily. Rickets developing in pigs which had not received the vitamin D supplement was rapidly cured by dosing with calciferol at a level providing 3,780 I.U. vitamin D daily.

In one experiment, the 20% yeast was replaced with 9% meat-and-bone meal, and 6% of sodium phosphate was included. Of six animals so fed, three died within 2–3 weeks with lesions of gastro-enteritis. The remainder did not grow very well, but remained free from evidence of rickets. It is therefore concluded that the rachitogenic effect of yeast is not due entirely to its high content of available phosphorus.—A. N. WORDEN.

KORNBERG, A., DAFT, F. S., & SEBRELL, W. H. (1944). **Production of vitamin K deficiency in rats by various sulfonamides.**—*Publ. Hlth Rep., Wash.* **59.** 832–844. [Authors' summary copied *verbatim*]. **333**

Sulfapyrazine, sulfadiazine, or sulfathiazole fed to rats at a 1-per-cent level in purified diets resulted in a regular production of severe hypoprothrombinemia and hemorrhage in 2 to 3 weeks. Sulfaguanidine, sulfanilamide, and succinyl sulfathiazole were much less effective.

Vitamin K, orally, prevented this hypoprothrombinemic and hemorrhagic state.

Crystalline biotin and crystalline folic acid, alone or combined, did not influence the production of vitamin K deficiency by sulfadiazine.

The type of dietary casein may be important in the development of vitamin K deficiency. Alcoholic extracts of leached casein showed vitamin K activity.

Rats made severely hypoprothrombinemic with a sulfonamide gave uniform and consistent responses to orally administered vitamin K.

A method for assay of the vitamin K activity of crude substances is suggested.

DE FIGUEIREDO, J. M. P. DA S. M. (1943). A farinha de peixe na alimentação do gado. **[Value of fish meal for stock].**—*Bol. pec., Lisboa.* **11.** No. 3. 63–192. [French summary]. **334**

A general review of the subject, with some reference in general terms to toxicity of fish meal.

SMITH, D. C., & PROUTT, L. M. (1944). **Development of thiamine deficiency in the cat on a diet of raw fish.**—*Proc. Soc. exp. Biol., N.Y.* **56.** 1–3. **335**

Severe vitamin B_1 deficiency resulted usually within 23–40 days, in cats restricted to a diet of raw carp or raw herring. Vitamin B_1 was curative. Two animals proved unusually resistant to the effects of the raw carp diet, one remaining healthy up to 66 days, when it was withdrawn from the experiment, and the other not manifesting symptoms until the 77th day. Diets consisting exclusively of raw perch, cat-fish, butter-fish [? dollar fish, *Poronotus triacanthus*], or spots [? *Leiostomus xanthurus*] were not harmful.—A. N. W.

SILBER, R. H. (1944). **Studies of pantothenic acid deficiency in dogs.**—*J. Nutrit.* **27.** 425–433. **336**

Earlier, unpublished studies are quoted to illustrate the fact that, whereas pups survive depletion of pantothenic acid for one month only, adults are capable

of surviving on a pantothenic acid deficient diet for six months or longer. One such adult was still maintaining its body weight after 40 months on such a diet.

In the further experiments described, a basal diet was employed comprising 30% extracted casein, 41% glucose, 21% hydrogenated vegetable fat, 0·15% maize oil, 2% cod liver oil, 3% salt mixture, and 2·85% bone ash. Supplements of α-tocopherol, vitamin B_1, riboflavin, nicotinic acid, vitamin B_6, choline chloride, and inositol were given to all dogs, while some controls received 40 mg. calcium pantothenate plus 5 g. dried beef liver daily, and other controls the pantothenate only. Some of the deficient and control dogs were paired-fed.

In pups, the first indications of pantothenate deficiency were erratic appetite and a decrease in urinary excretion of pantothenic acid. The deficiency responded to oral dosage with pantothenate, but untreated animals collapsed after two months. In older dogs the effects upon appetite and upon urinary excretion were considerably delayed, but responded to repeated oral dosage with pantothenate. In neither pups nor older dogs were there gross changes in the mouth, eyes, ears, anus, or skin, although the hair of the deficient animals was somewhat coarse. A fatty liver was the only gross pathological change found on autopsy, but even this was not entirely specific, since it occurred also in those controls not receiving dried liver. The total lipoid and cholesterol contents of the blood and the acidity of the gastric juice were the same in control as in deficient animals.—A. N. Worden.

Best, C. H., & Lucas, C. C. (1943). **Choline—chemistry and significance as a dietary factor.**—*Vitamins and Hormones.* **1.** 1–58. New York: Academic Press Inc. **337**

A comprehensive review based upon 326 references. It deals with the discovery, nomenclature, constitution, synthesis, detection, and estimation of choline, choline as a dietary factor, the lipotropic effect of proteins and amino-acids, the intermediate metabolism of choline and other lipotropic factors, the relationship of the vitamin B complex to the lipotropic factors, the relationship of the lipotropic factors to cirrhosis of the liver produced by dietary means, the relationship between choline and butter yellow in hepatic tumours, choline and other lipotropic factors in avian nutrition, choline and acetylcholine formation, choline and lactation, the effect of choline upon blood cholesterol and experimental atherosclerosis, the question of lipotropic factors other than choline in pancreas and pancreatic juice, the biosynthesis of choline, and the mechanism of the lipotropic action of choline and other substances. It is interesting that, in contradistinction to McHenry & Patterson [*V. B.* **14.** 279.], the authors consider that choline should for the present take its place with the other members of the vitamin B complex, "from which it cannot now legitimately be separated in any complete consideration of metabolic changes".—A. N. Worden.

Hupka, E. (1944). Ein Beitrag zur Entstehung der Grastetanie. **[The aetiology of grass tetany].**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* January 21st. 27–28. **338**

"Grass tetany" occurs in cattle turned out to grass in the spring. H. considers that it is most common when animals are allowed to graze in fields which have been heavily fertilized with manures containing potassium. An example is given of a field near Hamburg on which molasses residues were spread in 1939. Many of the cows which grazed this field in 1940 suffered from "grass tetany". The severity of the tetany was less in succeeding years, so that by spring 1943 no symptoms of tetany occurred. The molasses residues had a relatively high K and N content and low P content and were probably acid. The acidity might have reduced the available Ca of the soil.—E. Boyland.

See also absts. **321** (swine nutrition in wartime), **424** (ruminant deficiency diseases in W. Australia), **316** (wheat germ oil), **390** (methionine), **346** (dietary deficiencies in rats), **435**, **436** (books).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Villares, J. B. (1940). Climatologia zootécnica. I—Considerações gerais. II—Os valores hemométricos como índice de aclimação do Bos taurus. **[Climate and animals. I.—General considerations. II.—Haemoglobin values as an indication of the acclimatization of cattle].**—*Rev. Indústr. anim.* **3.** No. 2/3. 3–19, & No. 4. 7–33. [English summary to part I]. **339**

Villares. (1941). Climatologia zootécnica. III—Contribuição ao estudo da resistência e susceptibilidade genética dos bovinos ao *Boophilus microplus*. IV—O valor da termometria aclimação genética do gado bovino. **[Climate and animals. III.—Resistance and genetic susceptibility of cattle to *B. microplus*. IV.—Thermometry as an indication of the acclimatization of cattle].**—*Bol. Indústr. anim., S. Paulo.* **4.** No. 1. 60–86, & No. 3–4. 3–26. [English summaries]. **340**

I. The author discusses the relationship between animals and climate in general terms, referring more specifically to the effects of tropical sunlight, excessive heat, tropical vegetation etc. on cattle imported into Brazil.

II. The author examined 992 samples of blood from 124 bovine animals of different breeds. In the native Brazilian race Caracu, there was an average of over 8 million red corpuscles per ml., in contrast to an average of 5 million in imported Dutch Friesians, 6 million in Normandy cattle, and 7 million in Guernseys. Descendants of imported cattle bred in the country had rather higher counts than the original imported animals. The author considers that animals with a high red cell count are more likely to withstand the Brazilian climate than those with a lower count. He discusses the factors which may alter the blood count such as parasitism, temperature, and excessive sunlight.

III. It was found that Indian and European breeds of cattle were more susceptible to infestation with *Boophilus microplus* than the native breeds. European cattle were particularly susceptible. Of the European breeds, Brown Swiss cattle proved more resistant than Aberdeen-Angus, Friesian, and Flemish animals. While Indian cattle are fairly resistant, Nellore cattle were even less susceptible than Gir and Gujerath breeds.

IV. The author studied the variations in temperature of native and imported cattle under varying external temperatures. The temperatures of European cattle generally varied more than those of native cattle under the same external conditions. Variations in Guernsey cattle were nearer those of the native breeds than in Dutch Friesians. Although results are by no means conclusive, the author considers that thermometry in conjunction with the study of blood samples could be of assistance in choosing breeds suitable for acclimatization in Brazil.—Miller Watson.

Owen, E. C. (1944). **The excretion of borate by the dairy cow.**—*J. Dairy Res.* **13.** 243–248. **341**

Because of the possibility of using borax and boric

acid as a preservative for cattle cakes and similar feeding stuffs, metabolism experiments were conducted on two cows in mid-lactation to determine the fate of boronated substances after ingestion by the dairy cow. During an experimental period of 42 days each cow had a total daily intake of 18–23 g. borate ; during control periods of 12 days the daily intake was about 2 g. per day supplied by the normal foodstuffs.

The urinary output of borate was practically double the faecal output, while the excretion in the milk was very small ; values for the daily excretion during the experimental feeding periods were 13–16 g. in the urine, 5–7 g. in the faeces, and 0·3–0·6 g. in the milk, compared with values of 1·5, 1·0, and 0·1 g. respectively for the control period. There was no detectable retention of borate in the body.

No adverse effects on the health of the animals were observed as a result of the borate feeding and the milk yield was well maintained. The boron content of the milk increased from a normal level of about 0·7 p.p.m. to over 3·0 p.p.m., but the latter concentration is too low to affect adversely the value of milk for human consumption.

It is, however, pointed out that there is some risk of damage to crops by the use of farmyard manure made from the excreta of animals fed on boronated rations. —R. Allcroft.

Robscheit-Robbins, F. S., Miller, L. L., & Whipple, G. H. (1944). **Gelatin—its usefulness and toxicity. Blood protein production impaired by continued gelatin by vein.**—*J. exp. Med.* **80.** 145–164. **342**

The effect of intravenously administered gelatin upon plasma protein and haemoglobin production was studied in dogs standardized in an anaemic and hypoproteinaemic state by regular bleeding and a low-protein dietary regime. No immediate toxic responses and no signs of any anaphylactoid reactions were observed following the intravenous administration of 6% gelatin solutions, while evidence for the production of new blood protein from the gelatin was equivocal. On the other hand, gelatin administered intravenously during 1–2 weeks (total 3–17 g. per kg. body weight) usually caused inhibition of blood protein production, signs of intoxication, much loss of weight, and even death. Some experiments in which gelatin was administered intravenously for 2–3 days (total 1–2 g. per kg. body weight) in conjunction with, and followed by, amino acids or casein digests gave no evidence of toxic symptoms and showed ample production of new haemoglobin and plasma proteins in the weeks following the gelatin injections. Gelatin of small molecular weight (degraded by autoclaving) was no less toxic than the standard material ; the site of toxic damage was not clear, but results appeared to implicate the liver. The general conclusion derived from the experiments cited is that the use of gelatin by vein has, in the dog at any rate, definite limitations, but that the results obtained in conjunction with amino-acid mixtures may warrant clinical study to determine whether gelatin and amino acids can be utilized to tide over the acute emergency in the first 2–3 days following haemorrhage, trauma, and shock, thus permitting the body to make its own blood proteins from the administered amino acids and the protein reserve stores.—J. Lochiel McGirr.

I. Charton, A., Minot, G., & Bressou, M. (1943). Electrocardiogramme normal du cheval. **[The normal electrocardiogram in the horse]**.—*Bull. Acad. vét. Fr.* **16.** 141–148. **343**

II. Charton, A., Minot, G., & Bressou, M. (1943). Les bruits normaux du coeur du cheval : étude phonocardiographique. **[Phonocardiographic study of the normal heart sounds in the horse]**.—*Ibid.* 218–224. **344**

I. The data discussed are the same as those reported earlier [*V. B.* **14.** 66, abst. 419].

II. A description is given of a phonocardiograph suitable for equine work, and of the heart sounds recorded with its aid. The average normal duration of the first sound—usually comprised of two vibrations—is 0·10–0·14 sec., and the mean frequency of the vibrations which constitute it from 30–60. Reduplication of the first sound is uncommon : when it occurs the duration is no longer than that of a single sound. The beginning of the first sound is always later than that of the electrical waves recorded from the ventricle, taking place some 0·02 to 0·03 sec. after the summit of the R wave. This indicates that the auricles play no part in the first sound.

The second sound usually consists of about 4–5 vibrations. The frequency of the vibrations is between 80 and 120. The duration of the second sound is from 0·06–0·08 sec. Reduplication is as uncommon as in the case of the first sound.

The interval separating first from second sounds is variable. About 8% of horses are said to have a third sound.—A. N. Worden.

Barron, D. H. (1944). **The changes in the fetal circulation at birth.**—*Physiol. Rev.* **24.** 277–295. **345**

The use of X-ray cinematography, following the injection of radio-opaque substances into the foetal bloodstream, and the study of the oxygen content of foetal blood has added fresh evidence concerning the problem of the foetal circulatory pattern. B. reviews the information revealed by the application of these two methods and discusses the structure of the heart and great vessels which allows of this selective distribution.

In early gestation nearly all the posterior caval bloodstream enters the left atrium *via* the foramen ovale, but as full-term approaches, a change in position of the crista dividens (septum secundum) directs a greater proportion of the posterior caval stream into the right atrium. This is accompanied by an increased flow through the pulmonary capillaries and the aortic isthmus and a decreased flow through the ductus arteriosus ; thus gradually the prerequisites for the establishment of an adult pulmonary circuit are created.

Functional closure of superfluous foetal blood pathways occurs rapidly after birth. In the case of the foramen ovale this is brought about by a change in intracardiac pressure ; in the case of the ductus venosus and ductus arteriosus, closure is by the action of sphincter muscles. Possibilities are suggested, but no conclusions are advanced as to the mechanism which stimulates and times the action of these two sphincter muscles.—C. W. Ottaway.

Griffiths, W. J., Jr. (1944). **Absence of audiogenic seizures in wild Norway and Alexandrine rats.**—*Science.* **99.** 62–63. **346**

Wild Norwegian and Alexandrine rats, which had been trapped in alleys, granaries, etc., were subjected to sounds of the same frequency as those reported to give rise to great excitement and convulsions in tame rats [see Finger (1942). *Amer. J. Psychol.* **55.** 68]. The tests were negative. It had previously been reported by Farris & Yeakel [(1943). *J. Comp. Psychol.* **35.** 73.] that wild Norwegian rats bred in the laboratory for 19 generations were markedly susceptible to seizures.

Reference is made to conditions of domestication which may influence the appearance of these seizures, and in this connexion the work of Chick *et al.* [*V. B.* **10.** 956.] is mentioned, in which seizures were observed

in rats receiving diets deficient in Mg, vitamin B_1, or vitamin B_6.—A. N. Worden.

Shannon, J. A. (1942). **The control of the renal excretion of water. 1. The effect of variations in the state of hydration on water excretion in dogs with diabetes insipidus.**—*J. exp. Med.* **76.** 371–386. **347**

Experiments were performed on four bitches with chronic polyuria following surgical ablation of the neurohypophysis at least one year previously. The changes in the renal excretion of water following extensive changes in the degree of bodily hydration did not appear to differ qualitatively from those in normal dogs. Extensive dehydration due to renal water loss was not accompanied by circulatory collapse or by an extensive fall in glomerular filtration rate. It is suggested that the increased polyuria which resulted from ingestion of 0·5% saline was due to deficiency of antidiuretic hormone.—A. N. Worden.

Anderson, J. (1944). **The periodicity and duration of oestrus in zebu and grade cattle.**—*J. agric. Sci.* **34.** 57–68. **348**

Records are given for 1,130 oestrous cycles in zebus and 678 cycles in grades (successive crosses of mainly Shorthorn and Ayrshire bulls × zebu cows). The mean length was 23·03 days in zebus and 22·42 days in grades. The mean duration of oestrus was 4·78 hours in zebus and 7·40 hours in grades. These findings confirm previous observations made by A. [*V. B.* **8.** 255]. Neither exposure to artificial light at night nor feeding a supplementary ration had any effect on the oestrous cycle. Seasonal variations in both the length of the cycle and duration of oestrus occurred in zebus, but in grades they were much less marked. An association between climatic conditions and sexual function was noted in that a season of increased temperature and sunshine was associated in grades and zebus with increased sexual function and *vice versa*.—N. J. Scorgie.

Hammond, J., Jr. (1944). **On the breeding season in the sheep.**—*J. agric. Sci.* **34.** 97–105. **349**

Observations are presented on the extent of the breeding season, length of the oestrous cycle, fertility, duration of pregnancy, and growth rate in sheep. The material studied consisted of a small experimental flock of closely related Suffolk × Border Leicester-Cheviot ewes and of the genitalia of ewe lambs collected from an abattoir. The breeding season was found to extend from early October to late March and was fairly evenly spaced on either side of the shortest day. In the first half of the season the period of the oestrous cycle lengthened slowly and steadily; in the second part it became more variable, but the trend was toward increase in length. From the start of the season the frequency of twinning increased quickly to a peak in November and then declined. At the end of the season there was a high proportion of infertile services. Examination of the abattoir material revealed the regular occurrence of large follicles throughout the non-breeding season, and in a proportion, isolated ovulations were noted. In lambs having regular cycles the ovulation rate was higher at the beginning than at the end of the breeding season. At all times in the season the ovulation rate was much above the incidence of twinning observed in ewe-lamb flocks. The relation of light factors, hormones, and nutrition to the observations recorded is discussed, and various assumptions and hypotheses are formulated.—N. J. Scorgie.

I. Murphree, R. L., Warwick, E. J., Casida, L. E., & McShan, W. H. (1944). **Potential fertility of ova from ewes treated with gonadotropins.**—*J. Anim. Sci.* **3.** 12–21. **350**

II. Casida, L. E., Warwick, E. J., & Meyer, R. K. (1944). **Survival of multiple pregnancies induced in the ewe following treatment with pituitary gonadotropins.**—*Ibid.* 22–28. **351**

I. Groups of ewes in three different phases of the reproductive cycle were treated with pituitary extracts, treatment consisting of a single subcutaneous injection of follicle-stimulating extract on each of four successive days followed by an intravenous injection of luteinizing extract or of unfractionated extract on the sixth day. All ewes were artificially inseminated on the day of the intravenous injection and again on the following day. Fertilized ova at various stages of segmentation were recovered from 17 of 24 ewes treated in the follicular phase; no fertilized ova were recovered from five ewes treated in the luteal phase, whilst from nine anoestrous ewes only one fertilized ovum was recovered. The reason for the lack of fertility in the last two groups is not known. In the follicular group there were significant differences in the ability of different "batches" of follicle-stimulating extract to produce potentially fertile ova. Likewise, there were significant differences between ewes which were treated alike in their ability to produce potentially fertile ova. There were also significant differences in the number of ova recovered from all groups in relation to the corpus luteum number, the proportion of corpora lutea represented by ova being lower in the luteal and anoestrous groups. It is suggested that this indicates a greater tendency towards entrapment of the ova in these two phases than in the follicular phase.

II. Superovulation was induced in 25 ewes by treatment with pituitary extracts [see I]. All ewes were mated or artificially inseminated. The viability of the multiple conceptuses so induced was checked by observations on different animals at 2–5 days, 14–27 days, and 30–37 days. The numbers of ewes found to be pregnant at the different intervals were 6 of 7, 8 of 10, and 5 of 8 respectively. An average of 9·2 normal embryos per ewe, representing 70% of the ova ovulated, was found in the first period, 3·4 in the second period, and 0·8 in the third. Many dead and degenerate embryos were found in the later stages. The corpus luteum numbers of 20·8, 23·2, and 24·6 for the three groups were essentially the same, and it is believed that the initial ovulation and fertilization rates were comparable. Two possible causes of death are suggested (1) inadequate uterine environment due either to a direct or an indirect effect of treatment, or (2) abnormalities induced in the ova by the rapid maturation of follicles. An attempt was made to obtain information on the cause of death by transplanting ova from treated to normal ewes, but no conclusions were possible from the results obtained by this procedure.—N. J. Scorgie.

Guerreiro, R. T. da C. (1941). A fecundação artificial dos animais. Seu interêsse científico e aplicação prática em Portugal. [**Artificial insemination of animals: scientific interest and practical application in Portugal**].—*Rev. Med. vet., Lisboa.* **36.** 119–137. **352**

G. reviews many of the advantages to be gained from artificial insemination of animals. He begins with a history of the subject from the fourteenth century onwards, and then describes the organizations which have been built up to deal with artificial insemination in some European countries and in the U.S.A.

Artificial insemination would be particularly useful in sheep breeding in Portugal, since at present the country does not produce sufficient wool to meet the needs of its textile industry.—Isobel W. Brocklehurst.

Neves e Castro, A. V. (1941). Conferências realizadas no "Dia da Fecundação Artificial". [**Artificial**

insemination].—*Rev. Med. vet., Lisboa.* **36.** 61–76. **353**

A discussion on the factors which influence fertility in animals, with special reference to those types of infertility which are amenable to treatment by artificial insemination.—Isobel W. Brocklehurst.

Neves e Castro, A. V. (1941). Sôbre a conservação do esperma eqüino. **[Preservation of equine sperm]**. —*Rev. Med. vet., Lisboa.* **36.** 115–118. **354**

Equine spermatozoa as a rule retain their vitality for only a short time after collection. The author believes that a slight vitamin deficiency is an important factor in this rapid loss of motility. The presence of dead sperms at the time of collection lends support to this view, and it is possible that such dead sperms cause alterations in the chemical conditions of the semen, resulting in the rapid destruction of the remaining live sperms.

Lack of vitamin A in the animal's diet causes degenerative changes in the seminal vesicles, and destruction of the male germinal epithelium. Lack of vitamin D may affect the germinal cells, which are very sensitive to lack of calcium. Lack of vitamin E causes histological changes in the testicle which result in azoospermia and atrophy of the seminal vesicles. Sperm taken from a horse fed on a rich diet, supplemented by vitamins A, D, and E, retained its vitality for 24 hours—twice as long as would normally be expected.

Sperm keeps best at room temperature, diluted with either its own volume of isotonic glucose serum, physiological serum with gelatin, or a mixture of the two. The best months for the collection of equine semen are April-June ; after July, the results are less satisfactory. —Isobel W. Brocklehurst.

Kyaw, M. H. (1944). **Rapid method of standardization of the density of bull semen.**—*J. agric. Sci.* **34.** 106–109. **355**

The object of this work was to find an accurate and rapid method of estimating the density of bull semen by means of Brown's opacity tubes. By plotting density of sperm expressed in terms of millions of sperm per ml. against opacity of known dilutions of the semen, K. found that there was a simple linear relation between opacity and density, the latter expressed in terms of millions of spermatozoa per ml. being approximately five times the opacity standard. This formula was found to be applicable to the semen of all bulls used in the investigation. The use of the opacity standards was found in practice to be sufficiently accurate to enable an approximate estimate of density to be made, from which the doses to be used for insemination could be calculated, and also to enable any deterioration in the semen of a bull to be noted.—N. J. Scorgie.

Anderson, J. (1944). **The change in the *p*H of the semen of the bull after incubation.**—*J. agric. Sci.* **34.** 69–72. **356**

The alteration in the pH of bull semen after one hour's incubation at 37°C. was investigated, with a view to determining whether the pH change in this short period would provide a measure of the functional activity of the spermatozoa. The mean change in the pH of 134 undiluted ejaculates from seven clinically normal bulls was $-0{\cdot}302 \pm 0{\cdot}027$ after one hour's storage at 37°C. The greater the pH change, the lower was the initial pH and the higher were the initial motility and the number of spermatozoa per cu.mm. The greater the decrease in pH, the poorer was the motility after incubation. The motility was better maintained in semen diluted with egg-phosphate medium than in undiluted semen, there being a smaller pH change in this medium. There was no evidence of a relationship between the pH change and the motility after incubation, and the period of time for which a high motility was maintained during storage. It is suggested that the determination of the initial pH and the pH change after one hour's incubation may prove a useful and accurate method of evaluation of bull semen. —N. J. Scorgie.

Cantarow, A., Paschkis, K. E., Rakoff, A. E., & Hansen, L. P. (1943). **Studies on inactivation of estradiol by the liver.**—*Endocrinology.* **33.** 309–316. **357**

Further evidence is presented for the generally accepted belief that oestrogens are rapidly inactivated by the liver. On the basis of their own experiments and those of other workers, the authors formulate the following hypothesis which they believe to be in accord with all the available data :– oestrogen is removed from the blood by the liver cells, is converted to a substance possessing little or no oestrogenic activity, is in part stored temporarily in the liver in this form and is " reactivated " during the process of its excretion by the hepatic cells. The oestrogen probably undergoes an enterohepatic circulation similar to that of bile acids, being perhaps gradually destroyed or converted to a permanently inactive substance.—N. J. Scorgie.

Zondek, B., Sulman, F., & Sklow, J. (1943). **Inactivation of stilbestrol by liver *in vitro*.**—*Endocrinology.* **33.** 333–336. **358**

It has been previously shown that oral administration of oestrone is only about 20% as efficient as subcutaneous administration, whereas stilboestrol given orally is 50% as efficient as when given subcutaneously. The results now reported, which show that oestrone is more easily inactivated by liver pulp *in vitro* than is stilboestrol, suggest an explanation of this difference as well as of the finding that after hormone treatment stilboestrol is excreted in the urine in greater amounts than is oestrone. It is also suggested that the toxic side-effects of stilboestrol (nausea, vomiting, and dizziness in man) are possibly explained by the longer persistence in the body of stilboestrol than oestrone and its esters, the latter being more easily and completely inactivated by the liver.—N. J. Scorgie.

Picado T., C. (1943). Investigaciones sobre fisiopatologia tiroidea. **[Physiology and pathology of the thyroid gland]**. pp. 92. San Jose, Costa Rica : Secretaria de Salubridad Publica. [8vo] [English summary]. **359**

In this monograph, P. applies the principles of immunology to the study of the aetiology, diagnosis, and treatment of thyroid dystrophies. The work is based on the fact that hormones, acting as haptens, stimulate specific antibody formation, and that such antibodies have the power of limiting the activity of the related glands.—Isobel W. Brocklehurst.

Monie, I. W. (1944). **Why tie the cord? [Correspondence]**.—*Brit. med. J.* July 29th. 159–160. **360**

Reference is made to the presence of additional muscle fibres in the tunica media of the intra-abdominal portion of the umbilical arteries. These muscle bundles form subendothelial ridges, which project into the lumen of the vessel and appear to assist in bringing about fairly complete closure of the arteries following birth. The muscular wall of the vein is not so well developed, but its closure may be facilitated by a closing mechanism in the ductus venosus.

In spite of this evidence, it is recommended that in the human being the umbilical cord stump be ligated, as it has been found that this closing mechanism cannot always be depended upon.—C. W. Ottaway.

WEBB, R. M. (1944). **The lymph nodes of the head and neck in the domestic animals.**—*Aust. vet. J.* **20.** 181–188. **361**

The fundamental plan of arrangement of the lymph vascular system of the head and neck is described, and variations from it which are exhibited in the horse, ox, sheep, pig, dog, and cat are given, together with line diagrams showing the efferent connexions of the lymph nodes in these animals.

Comparison of the arrangements of the systems in these animals is rendered difficult by the variety of nomenclature in common use. A table of common synonyms is given as an appendix.

Lymph draining from the buccal and nasal mucous membranes passes through at least one lymph node before reaching the bloodstream, but it is pointed out that a different lymph node acts as the final or "terminal" node in each of these animals.

See also abstr. **337** (choline metabolism), **423** (potassium equilibrium in tissues), **408** (haematology), **385** (stilboestrol).

POISONS AND POISONING

I. SPIRA, L. (1944). **Some epithelial changes in fluorosis [human].**—*J. Hyg., Camb.* **43.** 400–401. **362**

II. SPIRA, L. (1944). **Incidence of dystrophies caused by fluorine in organs regulated by the parathyroid glands [human].**—*Ibid.* 402–409. **363**

[Author's summaries copied *verbatim*.]

I. Like the skin and its appendages, the teeth, nails and hair, so also other tissues of ectodermal origin are here shown to be affected by fluorine. The action of fluorine consists in lowering the level of the calcium in the blood and tissues. The epithelia of the mouth and the salivary glands, of the nasopharynx, the conjunctivae and the lachrymal glands may be affected. Signs and symptoms are thus produced which are closely similar to those usually attributed primarily to infection. It is suggested that an infection accompanying chronic fluorine poisoning is of a secondary nature, and that it is brought about by the loss of calcium in the body.

II. Dystrophies due to chronic fluorine poisoning in organs regulated by the parathyroid glands, namely the skin and its appendages, the nails, teeth and hair, and also in bones, are here shown to be unusually common in this country [Great Britain]. They should be regarded as easily detectable signs of a serious disturbance of the calcium metabolism of the body. Fluorine is a poison of which the action, in many respects, is similar to that of arsenic. It is the task of the authorities responsible for the health of the nation to search for ways and means capable of minimizing its effects.

MUENSCHER, W. C., & WINNE, W. T. (1942). **Common poisonous plants.**—*Ext. Bull. Cornell agric. Exp. Sta.* No. 538. pp. 31. **364**

A bulletin for stock-owners, giving brief information concerning 28 of the commoner poisonous plants found in New York State. The salient features of each plant are clearly illustrated by 3–4 excellent line drawings, and details are given of the common and scientific names of the plants, their habitat, likelihood of consumption with resultant poisoning, and the symptoms produced thereby. Treatment is not mentioned.

—J. O. L. KING.

BAXTER, C. M. (1944). **Broadleaf milkweed poisoning.**—*Cornell Vet.* **34.** 256–259. **365**

This is a clinical article. Two horses and four goats died a few hours after eating wheat straw containing small quantities of broad-leaf milkweed (*Asclepias eriocarpa*). In the two horses the principal symptoms were dullness with hanging of the head, depressed intestinal movement, foul odours from the mouth, anorexia, and spasmodic sweating. In diagnosing an outbreak, differentiation from equine encephalomyelitis would have to be considered. Symptoms in goats were similar, but were slower in developing.—R. M. ARNOLD.

ROBERTS, S. J., & HALLER, C. S. (1944). **A suspected case of trematol or white snake root poisoning.**—*Cornell Vet.* **34.** 266–269. **366**

A five-year-old Guernsey cow was observed to tremble violently and, when stimulated, to show great excitement and to collapse for a short time. It died 10 days later. The blood count and haemoglobin value were normal, but blood sugar was low. There was slight albuminuria, and the Ross test for acetone was positive. A test for trematol in the milk was negative, but the accuracy of this test was questioned. P.M. examination did not reveal any significant changes. Four out of the five cattle on the farm had died of a similar condition in the previous three months.

A sow which had received milk from this cow became depressed, developed twitching of the eyelids leading to apparent blindness, staggering, and died five days later. A g. pig given a small quantity of the milk did not show any symptoms. Although an examination of the pasture failed to reveal any *Eupatorium urticaefolium*, no further cases developed after a wooded swampy area had been fenced off, and trematol poisoning is considered to have been a possible cause.

—J. O. L. KING.

EMMEL, M. W. (1944). **The toxicity of Glottidium vesicarium (Jacq.) Harper for cattle.**—*J. Amer. vet. med. Ass.* **104.** 222. **367**

It was found that 3 lb. of the ground immature seeds of the "coffee-bean weed", administered as a drench to Jersey steers of 200–250 lb. body weight, caused a short illness; 5 lb. were fatal in 36 hours. 8 lb. of ground mature seeds caused slight symptoms and 11 lb. caused death in 40 hours. The symptoms were depression, frequent urination, and inappetence leading to prostration. P.M. the kidneys showed generalized albuminous degeneration of the tubules with necrosis of the tubular epithelium; the liver showed albuminous degeneration and small foci of necrosis, and the abomasum and duodenum, congestion. Although the weed is common, poisoning is rare as the mature seeds are hard and unpalatable.—J. O. L. KING.

SCHMIDT, L. H., HUGHES, H. B., & BADGER, E. A. (1944). **The toxicity of sulfamerazine and sulfamethazine.**—*J. Pharmacol.* **81.** 17–42. **368**

There are only small differences between the acute toxicities (in mice) of sulphamerazine, sulphamethazine, and sulphadiazine. When administered parenterally (but not orally), sulphamethazine was somewhat more toxic than the other drugs. Acetyl sulphamethazine was slightly less toxic, however, than the acetyl derivatives of the other two drugs. The three drugs had about the same adverse effects on the weight of growing rats and of mature dogs and monkeys when comparable blood levels were maintained over two or more weeks. There are striking differences in the renal toxicities of these sulphonamides. Sulphamethazine seems to be devoid of renal toxicity even with high blood levels. Sulphamerazine has decidedly less renal toxicity than sulphadiazine. The most important factor in these differences is probably the solubility of the drugs in acid urine, sulphamethazine (the most soluble drug) having the least toxicity and sulphadiazine (the least

soluble drug) having the highest toxicity. It is noted that alkalinization of the urine largely eliminates these differences. The view is taken that sulphamerazine and sulphamethazine are useful additions to the sulphonamide drugs.—J. M. Robson.

Callomon, F. T. (1944). **The pathologic changes produced by prolonged administration of sulfapyrazine and sulfamethyldiazine (sulfamerazine) in the kidneys of rabbits as compared with sulfathiazole and sulfadiazine.**—*J. Lab. clin. Med.* **29.** 574–584. [Author's summary copied *verbatim*]. **369**

Under the conditions of our experiment, sulfapyrazine and sulfamethyldiazine (sulfamerazine), when given in doses of not more than 0·05 or 0·1 Gm. per kilogram twice a day for ten days in succession (20 doses), did not produce marked tissue damage in the kidneys of rabbits, except for an occasional focus of tubular epithelial necrosis in a few areas. The same results were obtained with sulfathiazole and sulfadiazine. All rabbits in our experiments receiving doses of 0·05 or 0·1 Gm. per kilogram survived.

When doses of 0·2 or 0·25 Gm. per kilogram were given, all compounds showed nephrotoxic effect in varying degrees.

Sulfathiazole in dosage of 0·2 Gm. per kilogram produced a lesser degree and lesser extent of kidney damage than did the other compounds. Sulfapyrazine produced less kidney damage than did sulfadiazine or sulfamerazine.

Sulfamerazine, in doses of 0·2 or 0·25 Gm. per kilogram, showed great ability to cause the formation of gross intrarenal and extrarenal concrements (uroliths) as observed in five of six rabbits. This was not observed with sulfapyrazine and sulfathiazole at equal dosage and only in two of six rabbits with sulfadiazine, where the extrarenal concrements in the renal pelves were small and scarce.

Mattis, P. A., Benson, W. M., & Koelle, E. S. (1944). **Toxicological studies of phthalylsulfathiazole.**—*J. Pharmacol.* **81.** 116–132. **370**

Evidence is presented which allows the conclusion that the absence of toxic effects following the oral administration of large doses of phthalylsulphathiazole is attributable to the low concentration produced in the blood and other tissues. This results from the retention in the intestine of all but small amounts of the drug and the rapid excretion by the kidneys of that which is absorbed. The experiments were performed on mice, rats, and monkeys. Intraperitoneal injection into monkeys of aqueous solutions of sodium phthalylsulphathiazole in doses of 0·1 g. per kg. per day caused no toxic manifestations, with the exception of mild toxic nephrosis, and gave rise to average blood levels of 4·2 mg. % of free, and 13·7 mg. % of total, sulphathiazole. Six monkeys given phthalylsulphathiazole orally, every four hours for 30 days, in doses up to 5 g. per kg. per day, survived the test period and showed no significant blood changes and no histopathological changes attributable to the drug. In the two monkeys which received the highest dose, only anorexia and loss of weight were observed. The average four-hour blood concentration in the monkeys receiving the highest dose was 0·7 mg. % of free, and 1·3 mg. % of total, sulphathiazole.—J. M. Robson.

See also absts. **333** (toxicity of sulphonamides), **390** (of mapharsen), **310** (tick paralysis).

PHARMACOLOGY, THERAPEUTICS AND DISINFECTION

Stansfeld, J. M., Francis, A. E., & Stuart-Harris, C. H. (1944). **Laboratory and clinical trials of patulin.**—*Lancet.* **247.** 370. **371**

Patulin, a metabolic product of *Penicillium patulum*, was described by Raistrick *et al.* [*V. B.* **14.** 211.] and tested in the treatment of the common cold. The preliminary results appeared to be favourable. Clinical trials, however, during the season of autumn colds, in which neither investigator nor patient knew whether patulin or control solution had been used for treatment, have now given negative results. Patulin was also of no value in the treatment of human cases of conjunctivitis. Patulin is bacteriostatic against a wide range of Gram-positive and Gram-negative bacteria. Its bacteriostatic activity is materially reduced by incubation in broth or by the addition of horse serum. Toxicity experiments in mice have shown that there is only a small margin between toxic and bacteriostatic concentrations.—J. M. Robson.

—. (1944). **Clinical trial of patulin in the common cold. Report of the Patulin Clinical Trials Committee, Medical Research Council.**—*Lancet.* **247.** 373–375. **372**

A large clinical trial in widely distributed areas in Great Britain was carried out between December 1943 and April 1944 in a number of factories and schools. A careful examination of the results provides no evidence that patulin is of value in the treatment of the common cold. The test solution was administered by instillation or by spraying.—J. M. Robson.

Bigger, J. W. (1944). **Inactivation of penicillin by serum.**—*Lancet.* **247.** 400–403. **373**

Penicillin is inactivated by contact with human serum or blood. The degree of inactivation varies greatly with different specimens of serum, and is much greater at body temperature than at lower temperatures. This inactivation may lead to underestimation of the amount of penicillin in a patient's serum. Inactivation *in vivo* is probably important chiefly in cases in which excretion of penicillin by the kidneys is slow.—J. M. R.

McKissock, W., Logue, V., & Bartholomew, I. (1944). **The need for asepsis in local penicillin therapy.**—*Brit. med. J.* Oct. 28th. 551–555. **374**

Penicillin will control Gram-positive, but not Gram-negative organisms, and hence care is needed to prevent infection of wounds with Gram-negative organisms (*Pseudomonas pyocyanea*, *Bacterium coli*, etc.), since this will delay healing and may occasionally lead to more serious consequences. Cross-infection of wounds by way of the penicillin tube is an obvious possibility, and it is suggested that this may be prevented by the use of an aseptic screw cap. The authors dealt with head-wound cases and they emphasize the need for proper closure of the scalp wound and very early skin healing to reduce hospital or cross infection. —J. M. Robson.

Foster, J. W., & Woodruff, H. B. (1944). **Microbiological aspects of penicillin. VI. Procedure for the cup assay for penicillin.**—*J. Bact.* **47.** 43–58. [For part III, see *V. B.* **14.** 357]. **375**

The authors use a strain of *Bacillus subtilis* in place of the *Staphylococcus aureus* strain used by Florey *et al.* The *B. subtilis* strain has an advantage in that a pasteurized spore suspension stored in the cold can be used for inoculation and can be handled without aseptic precautions. The spores can be seeded into agar at 55°–60°C. (*Staph. aureus* cells must not be heated above 42°C.) and the plates kept at 30°C. The optimum

inoculum is about 15,000 spores per ml. agar. Six cups are made in the agar of each petri dish by placing hot, short (12 mm.) lengths of 8 mm. glass tubing on the spore-containing agar. The hot glass tubes sink slightly into the agar and form cups, which are filled with known and unknown penicillin solution (containing an estimated probable 0·5–1 Oxford Units per ml.). After incubation for 12–16 hours at 30°C., the zones of inhibition of bacterial growth are measured.
—E. BOYLAND.

BIGGER, J. W. (1944). **Synergic action of penicillin and sulphonamides.**—*Lancet.* **247.** 142–145. **376**

The growth of *Staphylococcus pyogenes* in broth containing penicillin in concentrations too low to inhibit growth, is inhibited by low concentrations of sulphonamides. Sulphathiazole is more effective than sulphanilamide or sulphapyridine is assisting penicillin to control the bacterial growth. The effect was observed in eight strains of *Staph. pyogenes*, though the degree to which sulphathiazole enhanced the action of penicillin varied among the strains. It is suggested that the synergistic action of sulphonamides and penicillin should be employed in clinical treatment of suitable infections.
—E. BOYLAND.

FINGER, G. (1943). Ueber die Beeinflussung spezifischer Immunkörper durch Sulfonamide. **[The influence of sulphonamides on immune bodies].**—*Z. ImmunForsch.* **103.** 372–380. **377**

Dosing of rabbits with up to 2 g. per kg. per day of sulphonamide did not appear to affect the antigenic response (as measured by agglutination) to intravenous injection of *Salmonella paratyphi*, *S. enteritidis*, or *S. suipestifer*.—E. BOYLAND.

HAAG, F. E. (1943). Der Einfluss der Sulfonamide und der p-Aminobenzoesäure auf die Phagocytose. **[Influence of sulphonamides and *p*-aminobenzoic acid on phagocytosis].**—*Z. Hyg. InfektKr.* **124.** 636–637. **378**

Both sulphonamides (0·2–0·5%) and *p*-aminobenzoic acid (0·05%) increase phagocytosis. The significance of these results is being investigated.
—J. M. ROBSON.

HARNED, B. K., MILLER, R. E., WIENER, M., & WATTS, N. P. (1944). **A potentiated chemotherapeutic action of sulfathiazole and quinine.**—*Proc. Soc. exp. Biol., N.Y.* **55.** 234–235. **379**

Tests were made on 289 mice infected with *Streptococcus pyogenes* (strain 1048M). There were more survivors when treatment consisted in administration of sulphathiazole and quinine (as the ethyl carbonate) than of sulphathiazole alone, and the difference is statistically significant.—J. M. ROBSON.

SCHMIDT, L. H., SESLER, C. L., & HUGHES, H. B. (1944). **The chemotherapeutic activities of sulfamerazine and sulfamethazine.**—*J. Pharmacol.* **81.** 43–57. **380**

Sulphamerazine and sulphamethazine were slightly superior to sulphadiazine in the treatment of pneumococcal septicaemia in mice and meningitis in rats. Sulphadiazine was at least as effective as the other drugs against infections with β-haemolytic streptococci and Friedländer's bacilli and was distinctly superior against infections with staphylococci and dysentery bacilli. The results *in vitro* did not agree with those *in vivo*, but the authors attach more importance to the data obtained in animals. The relative activities of the drugs *in vitro* were found to depend on the test medium.
—J. M. ROBSON.

FELDMAN, W. H., HINSHAW, H. C., & MANN, F. C. (1943). **Chemotherapy in tuberculosis—an appraisal of present evidence and of future possibilities.**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 84–95. **381**

An account is given of the present position of chemotherapy in TB. Since RICH & FOLLIS [*V. B.* **10.** 552.] reported that sulphanilamide had a slight but definite inhibitory effect on the development of TB. in g. pigs, most of the work has comprised examination of the various sulphonamides and sulphones for this action. With the sulphonamides, variable results have been recorded, but there appears little doubt that some of the compounds have a definite deterrent effect on the course of experimental infection. The effect is, however, too limited to present any great possibility of its being of value in the clinical treatment of the disease.

With the sulphones, however, results have been obtained which show possibility of clinical application. The parent sulphone, 4:4′-diaminodiphenyl sulphone, has a high tuberculotherapeutic efficacy but unfortunately is highly toxic. Whether or not it can be employed in therapeutic dosage in man has yet to be determined. The authors have tested in g. pigs the parent sulphone and some ten derivatives of it. Five of these had a moderate to striking effect. The most efficacious were sodium p,p′- diaminodiphenyl-sulphone - N,N′- didextrose sulphonate (promin) and disodium formaldehyde sulphoxylate diaminodiphenylsulphone.—D. D. O.

SMITH, C. R. (1944). **Sulfanilamide and sulfapyridine in experimental tuberculosis.**—*Amer. Rev. Tuberc.* **50.** 163–166. [Spanish summary]. **382**

Sulphanilamide caused complete inhibition of tubercle bacillus cultural growth at a dilution of 1 : 1,000. Sulphapyridine caused some inhibition at 1 : 5,000 and complete inhibition at 1 : 1,000. Following injection with tubercle bacilli, g. pigs treated with sulphanilamide or sulphapyridine developed an allergic reaction to tuberculin more slowly than controls. There was distinctly less generalized TB. in the sulphonamide-treated animals than in controls, and less in the sulphapyridine than in the sulphanilamide-treated animals. The local lesions, including sites of inoculation and inguinal lymph nodes, were, however, larger in the treated than in the control groups.—J. M. ROBSON.

FELDMAN, W. H., HINSHAW, H. C., & MOSES, H. E. (1943). **Comparative effects on experimental tuberculosis of 2,4′-dichlorobenzophenone and 4,4′-diaminodiphenylsulfone.**—*Proc. Soc. exp. Biol., N.Y.* **54.** 60–62. **383**

The effect of 2,4′-dichlorobenzophenone (reported by FREEDLANDER—*V. B.* **13.** 348—to have a pronounced inhibitory action on tubercle bacilli *in vitro*) on experimental TB. in g. pigs was studied and compared with that of 4,4′-diaminodiphenylsulphone. The benzophenone derivative had no influence on either the course or the character of the disease process, while the sulphone exerted an impressive inhibitory action.
—J. LOCHIEL MCGIRR.

POTTER, T. S. (1944). **The possibility of prevention of tuberculosis by non-poisonous chemical air disinfection and by killed vaccines.**—*Science.* **99.** 406–407. **384**

Having shown that propylene or triethylene glycol rapidly kills fine suspensions of virulent tubercle bacilli at 70°F., P. suggests that bacilli suspended in these glycols might act as efficient immunizing agents. No experiments are described to test their protective value.
—R. E. GLOVER.

FAULKNER, G. H. (1944). **The bactericidal action of stilboestrol on tubercle bacilli.**—*Amer. Rev. Tuberc.* **50.** 167–175. [Spanish summary]. **385**

The survival of tubercle bacilli grown in nutrient media containing stilboestrol or hydroxy $\alpha : \beta$ diethyl stilbene was tested by inoculation of the cultures into g. pigs. Incubation for 24 hours in the presence of 1 : 10,000 of either compound generally killed the bacteria. The bactericidal action was reduced by the presence of organic matter.—E. Boyland.

Watson, N. E., & McMahon, M. C. (1944). **Plague. Sulfadiazine treatment of guinea pigs infected by artificial methods or by flea transmission.**—*Publ. Hlth Rep., Wash.* **59.** 385–393. **386**

Fifteen g. pigs were inoculated intradermally with *Pasteurella pestis* and developed plague ; they were treated with sulphadiazine and 13 recovered. Out of 15 controls, 13 died of plague. Eleven g. pigs infected with plague by flea bites developed the disease : they were treated with sulphadiazine and seven recovered. All nine control animals similarly infected died.

—J. M. Robson.

Hamre, D. M., Walker, H. A., Dunham, W. B., van Dyke, H. B., & Rake, G. (1944). **Chemotherapy of infections with *Cl. perfringens* in mice by homosulfonamides.**—*Proc. Soc. exp. Biol., N.Y.* **55.** 170–173. **387**

Sulphadiazine, homosulphanilamide (marfanil in the German literature—*p*-amino toluene sulphonamide hydrochloride) and its N′ methyl derivative were effective in the local treatment of gas gangrene (mice treated locally immediately after intramuscular infection with *Clostridium welchii*). The chronic toxicity of homosulphanilamide in mice appeared to be no greater than that of sulphanilamide. Homosulphonamides were not effective in the treatment of infections in mice with *Streptococcus pyogenes*, *Haemophilus influenzae*, or *Staphylococcus aureus*, but they were bacteriostatic *in vitro* for staphylococci.—J. M. Robson.

Richters, C. E. (1943). Der heutige Stand der Chemotherapie und Chemoprophylaxe der Trypanosomen und Piroplasmosen. [**The present position regarding the chemotherapy and chemoprophylaxis of trypanosomiasis and piroplasmosis**].—*Dtsch. tropenmed. Z.* **47.** 323–333. **388**

The treatment of animal trypanosomiasis is discussed, but little original matter is introduced. For valuable animals, naganol dissolved in antimosan solution is recommended for all species of trypanosomes, whilst for mass treatment of cattle weekly administration of tartar emetic is recommended, in doses not exceeding 0·5 g. For prophylactic purposes naganol is suggested, but it is said that protection does not persist for more than four weeks in animals, as against the 2–3 months' protection given by germanin in man.

The use of acaprin, trypanblue, and acriflavine in the treatment of infections due to *Babesia* and *Theileria* is discussed, and the value of trypan blue as a prophylactic for equine piroplasmosis due to *B. caballi* is confirmed. It should be given intravenously in doses of 1 g. once a month during the period of exposure to ticks.

Immunization by infection and treatment is discussed, but it is considered that more information is required as to how long such immunity lasts, and as to the optimum dose of drug to be used for this purpose.

—U. F. Richardson.

—. (1944). **The treatment of enteritis in swine.**—*N. Amer. Vet.* **25.** 148–154. **389**

This comprises a series of notes by the following veterinarians practising in the Corn Belt :– J. B. Bryant, S. Elmer, C. C. Hastings, G. A. Hawthorne, J. H. Krichel, L. N. Morin, R. M. Morton, and L. A. Tischhauser.

Somewhat varied views are expressed, but at least four separate types of enteritis are discussed, *viz*, pig paratyphoid, " bloody " enteritis (or " haemorrhagic dysentery "), pig pellagra, and enteritis ascribed to *Balantidium coli* infection. Moreover, enteritis in unweaned as well as in older pigs is included. Hastings states that common salt given in the food is a specific for " bloody " enteritis. In about four days the animals usually reach the saturation point and refuse to consume more ; they are then put back on to normal feed. An abundant supply of clean, fresh water is available to prevent salt poisoning.

Morton incriminates grass as an aetiological factor, alleging that young pigs are not able to deal with it satisfactorily. He states that enteritis is common in seasons when grass is plentiful but rare in autumn and winter when the animals are receiving diets consisting largely of grain. He reports good results with sulphaguanidine.—A. N. Worden.

Goodell, J. P. B., Hanson, P. C., & Hawkins, W. B. (1944). **Methionine protects against mapharsen liver injury in protein-depleted dogs.**—*J. exp. Med.* **79.** 625–632. [Authors' summary copied *verbatim*]. **390**

Depletion of body protein stores by means of low protein diet or plasmapheresis causes greater susceptibility to liver injury by the arsenical compound, marpharsen.

Normal dogs can tolerate mapharsen in doses of 0·006 to 0·008 gm. per kilo whereas in protein-depleted dogs doses of 0·002 to 0·0025 gm. per kilo cause liver injury with jaundice.

Methionine (2 to 4 gm.) given by mouth 20 to 24 hours prior to administration of mapharsen is protective and the dogs will tolerate 0·0045 gm. per kilo with no icterus developing.

Methionine (1 gm.) intravenously just prior to mapharsen injection is not as consistent in effecting protection, but the smaller dose may be responsible.

Hatfield, C. A., & Lockwood, J. S. (1943). **An evaluation of some of the materials commonly used for the preoperative preparation of the skin.**—*Surgery.* **13.** 931–940. [Authors' conclusions copied *verbatim*]. **391**

Through a modification of the Price technique [see *V. B.* **11.** 270.] by which the effectiveness of antiseptics on freshly scrubbed skin is evaluated, it is concluded that ethyl alcohol in strengths of 95 per cent and 70 per cent by weight is preferable to any of a group of commercially prepared agents specifically designed for skin sterilization.

Miller, B. F., Abrams, R., Huber, D. A., & Klein, M. (1943). **Formation of invisible, non-perceptible films on hands by cationic soaps.**—*Proc. Soc. exp. Biol., N.Y.* **54.** 174–176. **392**

Some cationic soaps, such as zephiran or phemerol, form an invisible, non-perceptible film on the hands. The film retains bacteria underneath it so that the hands appear to be sterile. Treatment of the film with an anionic (*i.e.* " ordinary ") soap destroys the film of cationic soap and releases organisms from the hands. The inner surface of the cationic soap film has no antibacterial action while the outside of the film is germicidal.—E. Boyland.

Neufeld, F., & Schiemann, O. (1943). Desinfektionsversuche an der Tageshand. [**Disinfection of the hands**].—*Z. Hyg. InfektKr.* **124.** 751–758. **393**

Ethyl alcohol in concentrations higher than 75% penetrates very well into the deeper layers of the skin. Hence it is more effective in killing the bacteria normally present on the hands than other disinfectants in common

use, *e.g.* corrosive sublimate, cresol soap, and lysol. 50% sagrotan is as effective as alcohol, while propyl alcohol is even more effective. Alcohol does not kill all the bacteria on the hands : 1 hour after its application as many or more organisms are present than before the disinfection. Better results are obtained when the hands are treated daily with alcohol ; the degree of disinfection then becomes very good, though not always complete, after the first few days. It is suggested that, for surgical work, the hands should first be disinfected with alcohol and then treated with zephirol in order to obtain a more prolonged effect.—J. M. Robson.

Wantia, J. (1943). Über die Desinfektions- und Reinigungswirkung des Methyl-, Äthyl- und Isopropylalkohols in Benzin. **[The disinfectant and cleansing action of methyl, ethyl, and isopropyl alcohols in benzene].**—*Arch. Hyg., Berl.* **130.** 129–137. **394**

Mixtures containing 1, 2, 85, and 95% methyl alcohol in benzene killed staphylococci within 5 min. With ethyl alcohol the most rapid effect was obtained with 10% (5 min.), and no effect was produced within 24 hours with mixtures containing 40% or more of ethyl alcohol. Isopropyl alcohol in benzene had no bactericidal effect. The best cleansing effects were obtained with mixtures containing 10–50% of ethyl or isopropyl alcohol.—J. M. Robson.

Neufeld, F., & Schütz, O. (1943). Untersuchungen über die Wirkung von Zephirol auf Sporen. **[Action of zephirol on spores].**—*Z. Hyg. InfektKr.* **124.** 746–750. **395**

Bacillus mesentericus spores were exposed to various dilutions of zephirol at room temperature. Even at dilutions as low as 1 : 5, all the spores were not killed in 48 hours.—J. M. Robson.

Schmidt, W. (1943). Zur Frage der Heissluftdesinfektion. **[Disinfection by hot air].**—*Z. Hyg. InfektKr.* **124.** 606–614. **396**

The value of hot air disinfection was tested by two methods, various materials being infected with a number of organisms. The results show that the effects of hot air are unreliable and not as good as those attained with steam disinfection.—J. M. Robson.

See also absts. **259, 333, 368-370** (sulphonamides), **321** (sulphathiazole in swine pneumonia), **251** (in turkey sinusitis), **265** (acaprin in equine piroplasmosis), **321** (treatment of swine enteritis), **316** (chemotherapy of tumours).

HYGIENE AND PUBLIC HEALTH

Black, L. A. (1943). **Surveys of milk laboratories in war areas in the United States. I. Practices observed in making agar plate counts. II. Practices observed in making direct microscopic examinations and methylene blue reduction tests.**—*Publ. Hlth Rep., Wash.* **58.** 1605–1623 & 1641–1656. **397**

I. A survey was made of the methods employed in bacteriological milk laboratories in the U.S.A., in order to determine whether or not they conformed with the recommendations set out in "Standard Methods for the Examination of Dairy Products" [*V. B.* **14.** 108].

The survey showed that of 408 laboratories investigated, 399 used the agar plate method of milk examination. Of these, 33 also used direct microscopic examination and 57 used the methylene-blue reduction method. Nearly half of the laboratories were using unsatisfactory pipettes and dilution bottles without markings ; approximately 40% did not have hydrogen-ion standards for checking the pH of media, and 50% did not have an approved colony counter. The absence of the last item of equipment accounted for some of the greatest errors in results. The preparation and sterilization of materials and the making of dilutions was usually fairly satisfactory. Errors in plating, however, were frequent and only five laboratories were noted in which the optimal incubation temperature of 32°C. was being used.

In general, the survey revealed that not one laboratory actually met all requirements either of equipment or technique. Only one laboratory conformed in apparatus, one in preparation, four in incubation, 17 in counting, and 34 in reporting results. This is despite the fact that all laboratories considered that they were strictly following the Standard Methods. Circulation of milk laboratory survey forms setting out the points of divergence generally requiring attention is expected to improve the position.

II. Examination was made of the deviations from the Standard Methods of 38 laboratories using the direct microscopic count method and 61 laboratories using the methylene-blue reduction test for milk examination. Of those using the former method, 11 did not use mechanical stages, but generally the apparatus and stains used fulfilled requirements. Deviations in technique were more common. In general, the apparatus used for the methylene—blue test fulfilled requirements, but over 25% of laboratories were not employing the methylene-blue thiocyanate tablets specified in the Standard Methods. Deviations in incubation were frequent and there was general deviation in the time and extent of agitation of samples.

In a discussion on the efficiency of the above two methods compared with the agar plate method, it is concluded that the last-named is definitely superior. It is evident, however, that very few laboratories use any of the tests to the best advantage.—D. D. Ogilvie.

Hungerford, T. G. (1941). **Ante-mortem inspection of table poultry.**—*Aust. vet. J.* **17.** 176–181. **398**

The system of *ante-mortem* inspection of poultry at the Municipal Poultry Market, Sydney, and the relationship of poultry disease to human health are reviewed.

The diseases of poultry commonly encountered in New South Wales are listed in order of importance and their significance in meat inspections is indicated. Among chickens there are catarrhal or "roup" diseases (*e.g.* infectious catarrh, infectious laryngotracheitis, fowl pox, and hypovitaminosis A), paralysis from various causes (*e.g.* various types of leucosis, neoplasms, severe tapeworm infestation, injuries) diarrhoea, cloacitis, coccidiosis and enterohepatitis, emaciation, neoplastic conditions, "water bag", "bumble foot", septicaemic infections with *Salmonella pullorum*, anaemia, favus, hypertrophic osteitis, spirochaetosis, fowl cholera, bruise injuries, and fractures. In turkeys sinusitis, enterohepatitis, fowl pox, and deformed breasts are most important. Ducks are not often found affected with lesions of any significance.

—H. B. Carter (Australia).

Seher, O. W. (1943). **Federal meat inspection in wartime.**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 67–70. **399**

During the year 1942–43, it was estimated that over 75% of the meat supply of the U.S.A. would receive Federal inspection. Before this, only about 66% was inspected. During the year ending June 30th, 1942, over 86 million food animals were inspected as

compared with approximately 70 million under peace-time conditions.—D. D. OGILVIE.

LEETE, C. S. (1943). **An epic investigation of streptococcal fever.**—*Rep. N.Y. St. Ass. Milk Sanit., 1942.* pp. 91–97. Discussion pp. 97–100. [Also appeared in *J. Milk Technol.* **6.** 331–334]. **400**

Twenty-three cases of scarlet fever and septic sore throat were reported in a small community, and it was found that these persons had consumed either raw milk or cheese curds made from the milk handled by one dairy manufacturing plant. This concern handled daily 2,039 churns containing 23,000 lb. of milk, which was produced by 331 herds comprising 6,069 cows. All milk received at this plant was then pasteurized, and an investigation started to find the source of infection.

Slide tests were made of milk samples from these cases, and the udders of all the cows were also examined. A haemolytic streptococcus, belonging to Lancefield's group A was isolated from one cow. The same strain was subsequently found in the throat of one of the milk handlers. It is considered that the sequence of infection was from this worker to the cow, into the milk, and so to the reported cases.—J. O. L. KING.

STEELE, J. H. (1943). **Epidemiology of food-borne diseases.**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass., 1942.* pp. 71–73. **401**

An outbreak is described of 13 cases of typhoid and 20 of severe enteritis in Ohio. Infection was transmitted by human carriers *via* milk. Transmission of enteric disorders by food is causing concern in the U.S.A. and is receiving attention from the public health authorities who are working in collaboration with local, veterinarians.—D. D. OGILVIE.

See also absts. **245**, **246** (TB. control), **252**, **258** (food poisoning) **256** (control of undulant fever in Russia).

TECHNIQUE AND APPARATUS

TOWNSEND, C. T., & ZUCH, T. L. (1943). **Studies on agar contamination as affecting the sterilization of culture media.**—*J. Bact.* **46.** 269–271. **402**

In the preparation of a bacterial vaccine, Huntoon's hormone agar was used. This was autoclaved in 200 ml. amounts in Roux flasks for 30 min. at 115°C. The official sterility test for the vaccine was seven days' incubation at 37°C. Fourteen days' incubation, however, showed some batches of vaccine, which had passed the seven days' test, to be contaminated with spore-forming bacilli. These organisms were isolated from the vaccine in various stages of preparation, from the incubated but uninoculated medium, and from various lots of agar used in preparation of the medium. The biochemical reactions of 28 cultures of these bacilli are given.

It was found that three samples of American agar contained 10,000–14,000 spores per gramme, whilst one sample of Japanese agar gave 1,000 spores per gramme.

Brewer's thioglycollate medium, as recommended by the U.S. Public Health Service, was found very unsatisfactory for the detection of these spore-forming bacilli and if fewer than 10,000 spores per gramme were present, germination was irregular or absent. A more satisfactory test broth was found to be beef extract 0·3%, tryptone 0·5%, glucose 0·1%, skim milk 1·0%; pH adjusted to 7·0.

It is suggested that to sterilize contaminated agar in litre Erlenmeyer flasks, autoclaving for 20 min. at 121°C. or for 35 min. at 115·6°C. is necessary. Roux flasks, due to the slower rate of heat penetration, require an extra 10 min. at both these temperatures. Solid agar, depending on the depth in the flask, requires 5–10 min. longer to sterilize than liquid agar.—J. E. LANCASTER.

ARENA, A. R., & CETRANGOLO, A. (1944). **Cultivation of the bovine tubercle bacillus.**—*Amer. Rev. Tuberc.* **50.** 58–67. [Spanish summary]. **403**

The authors consider that both glycerinated and non-glycerinated media should be used for the typing of tubercle bacilli originating from man, and that type determinations of certain strains can only be made by biological or serological tests. For a non-glycerinated medium, a modification of Sweany's potato flour, milk and egg media is recommended; it is said to give the best results for the culture and preservation of bovine strains and to be simple to prepare.—H. I. FIELD.

GASTINEL, P., NEVOT, A., & HEBRARD, P. (1943). Influence de l'huile d'olive neutre sur le développement des cultures de bacilles tuberculeux aviaires ou bovins sur milieu de Loewenstein. [**Influence of neutral olive oil on the development of avian or bovine type tubercle bacilli on Löwenstein's medium**].—*Ann. Inst. Pasteur.* **69.** 43–45. **404**

On Löwenstein's medium, flooded with neutral olive oil and incubated for four days before inoculation, growth of avian type tubercle bacilli was found to be delayed by seven days. Suspensions of avian or bovine types of bacilli in olive oil, incubated for five days and then streaked on to Löwenstein's medium did not grow, and were not infective to g. pigs.

Avian and bovine type bacilli, grown on Löwenstein's medium with 0·5 ml. neutral olive oil incorporated, produced "dwarf" colonies. These were composed of normally staining bacilli, produced normal colonies when subcultured on to ordinary media, and were pathogenic to g. pigs.—R. M. ARNOLD.

HAUDUROY, P., & SANSONNENS, R. (1943). Sur une technique de coloration permettant de différencier les bacilles tuberculeux des bacilles paratuberculeux. [**A staining technique to differentiate tubercle and Johne's bacilli**].—*C. R. Soc. Biol. Paris.* **137.** 693. **405**

In preparations stained by Konrich's staining method, sodium sulphite is used as a decolorizing agent. Tubercle bacilli resisted decolorization for 24 hours by this method, but the majority of strains of *Mycobact. johnei*, although resistant for 12 hours, were usually decolorized in 24 hours. It is suggested that this method of diagnosis should be treated with reserve; the authors consider that decolorized organisms may be regarded as *Mycobact. johnei*, but that those retaining the stain may not all be tubercle bacilli.—J. M. PETERS.

BARTEL, H. (1941). Ein neues Trockennährsubstrat für die Bunte Reihe. [**New dry culture medium substrate for bacteriological meat inspection**].—*Tierärztl. Rdsch.* **47.** 492–493. **406**

The examination of the growth in dye medium of every strain of paratyphoid organism isolated from meat was made compulsory in Germany in 1940, and in order to simplify the application of these tests, it became necessary to prepare a standardized dry culture medium substrate which would be an adequate substitute for freshly prepared media. A culture medium in powder form containing bromthymol blue was developed which proved to be superior to the freshly made preparations in sensitivity and growth promotion; it is available in tablet form. The nutritive qualities of the medium were so improved that even the Gärtner and Kiel strains showed good fermentation of dulcite and rhamnose after 10–12 hours' incubation, the so-called

"weak" reactions of these strains being due only to poor growth on insufficiently nourishing media.
—Ann F. Russell.

Wesselinoff, W. (1944). Vergleichende Untersuchungen an verschiedenen Nährlösungen für die Bunte Reihe. **[Nutrient media for bacteriological meat inspection].**—*Zbl. Bakt. I.* (*Orig.*). **151.** 151–158. **407**

Seven different nutrient media were used for salmonella cultures. It was found that the medium described by Bartels [see preceding abst.] was convenient.—O. Cruse.

Randolph, T. G. (1944). **Differentiation of leucocytes in the counting chamber by propylene glycol-aqueous stains: a screen for the detection of major blood abnormality.**—*Amer. J. clin. Path.* **14.** No. 5. Tech. Sect. 48–53. [Author's summary copied *verbatim*]. **408**

A propylene glycol-aqueous stain when used as a white blood cell diluting fluid permits an accurate quantitative counting chamber differentiation of polymorphonuclear, eosinophilic, and mononuclear leucocytes. It also possesses several technical advantages in comparison with the standard acetic acid diluent.

The total and differential counting chamber leucocyte counts and a hematocrit determination may serve as a screen for the detection of a major abnormality affecting the blood.

Vaidyanathan, S. N. (1944). **An adaptation of White's method for the collection of infective larvae from bovine faecal cultures and its practical application.**—*Indian J. vet. Sci.* **13.** 157–161. **409**

A modification of White's (1927) method of faecal culture is described. Fresh faeces of the right consistency are loosely spread on moist blotting paper, fitted to the bottom of a petri dish of 2½ in. diameter, the dish being filled half to three-quarters full. The dish is then placed in the centre of a petri dish of 5 in. diameter into which distilled or boiled water is run to within ¼ in. of its brim. This is then covered with an inverted petri dish of 5 in. diameter. The infective larvae which migrate into the water round the culture dish are collected therefrom.—H. D. Srivastava (India).

See also absts. **241** (mastitis tests), **248** (cultivation of tubercle bacilli), **271** (of leptospira in chick embryos), **306** (antiserum production in Russia), **311** (feeding ticks), **344** (phonocardiography in horses), **355, 356** (evaluation of bull semen), **375** (penicillin assay), **432** micrurgical and germ-free techniques).

MISCELLANEOUS

Merillat, L. A. (1944). **Veterinary Corps, Army of the United States.**—*Cornell Vet.* **34.** 195–198. **410**

This article is a reply to statements made by Herschberger [*V. B.* **15.** 34.] in a previous article concerning the organization of the U.S. Veterinary Corps during the war of 1914–18.—R. M. Arnold.

Petersen, W. E. (1944). **The action of the mechanical milker in relation to completeness of milking and udder injury.**—*J. Dairy Sci.* **27.** 433–440. **411**

P. describes a technique in which the excised udder can be used in the study of mechanical milking, and records his observations. When the intra-gland sinus pressure remained constant, the rate of milk withdrawn by the machine was constant for any given vacuum, but showed varying decreases with a fall in pressure. Coincidentally, the teat cups crawled upwards with each vacuum stroke, and the more rapid the crawl the more rapid the rate of decline of milk withdrawal. This upward crawl closed the orifice between the sinus and the teat and this accounts for the reported incomplete milking of some cows by machine. Tugging upon the teat cups when they begin to crawl with enough force to bring them part way down on the teats, prevents closure of the passage and permits complete evacuation of all the milk without resorting to hand milking. With a closed orifice, the vacuum within the teat becomes identical to that in the milk tube and may have a traumatizing action on the compressed tissues, predisposing to mastitis. Hand milkers exert a greater force with each squeeze (16–24 in. mercury) than does the milking machine vacuum. Stimulation of the cow to let down the milk 1 min. before attaching the machine increases milking speed. It is concluded that, properly operated, there is less danger to the teat and udder from machine than from hand milking.—H. I. Field.

Montgomery, I. W., & Blumer, C. C. (1942). **The rugging of sheep in Australia.**—*J. Coun. sci. industr. Res. Aust.* **15.** 10–12. **412**

Controlled trials in Australia have not substantiated the claims that "rugging" of sheep increased their body weight or wool production. The trials described were undertaken to investigate the effect of "rugging" ewes in cold climates, as shown by their body weight and ability to bear and rear lambs, and the effect of "rugging" on general health and indirectly on gastro-intestinal parasitism. The "rugging" showed a financial loss when costs were offset against wool returns. There was no compensating gain in well-being, lamb production, or in resistance to internal parasitism.—B. Johnston (Australia).

Brown, J. H., & Roy, G. D. (1944). **The Richardson ground squirrel, *Citellus richardsonii* Sabine, in southern Alberta: its importance and control.**—*Sci. Agric.* **24.** 176–197. **413**

Most of the information appearing in this article was collected during the course of the work of the Alberta Rocky Mountain Spotted Fever and Sylvatic Plague Survey, and much of it is published for the first time.

The Richardson ground squirrel is described, and data are provided upon its life history, habits, range, enemies, ectoparasites, internal parasites, population dynamics, its role in the transmission of spotted fever, sylvatic plague, and tularaemia, and its suspected role in the transmission of equine encephalomyelitis.

Methods of control are discussed at length, and the compositions of different types of poison bait are given. Calcium cyanide, as "cyanogas", is most effective, and is recommended for plague areas; among its many advantages is its lethal effect upon all ecto-parasites. Unfortunately its price is prohibitive for general use on a wide scale. Strychnine baits are said to be satisfactory, and there is some evidence that sodium arsenite mixed with oats constitutes an equally effective but cheaper bait.—A. N. Worden.

Irwin, J. O. (1943). **On the calculation of the error of biological assays.**—*J. Hyg., Camb.* **43.** 121–128. **414**

Formulae are given for the exact fiducial limits of the dose corresponding to a given response, or of the result of a biological assay. Graphs of hyperbolae illustrate the variation in these limits for change in the given response, according to whether the slope of the regression line of response on log. dose is significant,

positive but not significant, or just significant. The limits are always finite and real if the slope is significant, otherwise they are infinite except in the critical case where the slope is just significant, in which case at least one limit is infinite. The approximate formula previously used would have given finite limits of error even when the slope is not significant; in addition to this understatement of the width of the fiducial range, the approximate formula may bias its position.

Numerical examples (median-fertility dose of vitamin E) are given, and it is shown that a well-determined slope, based on sufficient experimental data, will practically remove the bias in the approximate formula.

—K. WILLIAMS.

REPORTS

GREAT BRITAIN. (1944). **Colonial Products Research Council. First annual report 1943-1944.** pp. 9. London: H.M. Stat. Off. [8vo] [2d.] **415**

The Council was appointed to review the field of colonial production; it is laid down, however, that in framing their programme they "will have as their objective the promotion of the welfare and prosperity of colonial peoples", and "that in formulating its research policy it will also call into consultation persons with expert knowledge in science, industry, and other related fields". The Council must also bear in mind that the low standard of living of colonial peoples is due, in part, to the fact that they are primary producers and therefore do not enjoy the higher standards which can be attained only by industrial activity.

Details are given concerning research work in progress. [No investigation appears to be in progress into the utilization of animal products.]—U. F. RICHARDSON.

—. GREAT BRITAIN. (1943). **Colonial Research Committee. Progress report 1942-1943.** pp. 26. Cmd. 6486. London: H.M. Stat. Off. [8vo] [6d.] **416**

This Committee was appointed to advise on the expenditure of the £500,000 a year provided by the Colonial Development and Welfare Act 1940 and to assist in co-ordinating the whole range of research in colonial studies to include problems of agriculture and human and animal health, as well as the newer problems of biology, physics and chemistry, social studies, colonial law and administration, topographical and geological surveys, engineering, and problems of industrial development.

As a preliminary, the Committee restricted itself during the year mainly to the task of surveying the special problems and needs of colonial research as a whole, including research in relation to animal health.

The position of veterinary research in the Colonies was considered. It was thought there might well be laboratories set up for the production of biological products and that each colony might have its own laboratory to study local problems and to do its own pathological work. The institution of regional research centres is suggested—by expansion of the Nigerian research laboratory at Vom for West Africa, and by improving existing facilities at Kabete for East Africa. In the West Indies, a preliminary disease survey of the Caribbean is required, in co-operation with the veterinary services of Venezuela, British Guiana, and in bordering provinces of Brazil.

The Committee looks to the Advisory Council on Agriculture, Animal Health and Forestry for definite recommendations for the organization of research on animal health.

Owing to war conditions few schemes have actually been approved under the Colonial Development Act. The undermentioned schemes were, however, approved. In Kenya, £2,200 for research at Naivasha livestock research station on the mineral content of natural pastures. In Tanganyika Territory, £7,640 for the financing of two schemes subsidiary to a major measure of RINDERPEST control. The following veterinary research stations are already established.

Nigeria.—The veterinary laboratory at Vom manufactures sera, vaccines and virus required in Nigeria, and also has accommodation for some research work; financed by the Colonial Government.

Gold Coast.—There is a laboratory for the manufacture of vaccines at Pong Tamale; financed by the Colonial Government.

Kenya.—Veterinary research station at Naivasha (nutrition and genetics); financed by Colonial Governments. Veterinary research institute at Kabete (animal pathology); financed by East African Governments. Kenya research laboratory at Kabete (all subjects); financed by Kenya Government.

Northern Rhodesia.—Veterinary laboratory at Mazabuka; financed by Colonial Governments.

Nyasaland.—Small diagnosis laboratory at Blantyre; financed by the Colonial Government.

Tanganyika.—Shinyanga research laboratory of the Tsetse Department.

Palestine.—Laboratories at Jerusalem dealing with all subjects including veterinary research. [No mention is made of the Government veterinary laboratory at Jaffa.]—J. A. GRIFFITHS.

GREAT BRITAIN. (1944). **Colonial Research Committee. First annual report 1943-44.** pp. 11. London: H.M. Stat. Off. [8vo] [2d.] **417**

This first annual report of the Colonial Research Committee covers much of the same ground as the progress report for 1942–43 [see preceding abst.] and the two reports should be read together. The report lists specific research for which approval has been given in the period under review and details the organization which has been set up for the supervision of colonial research. Under the section dealing with agriculture, animal health, and forestry the Committee reports that an *ad hoc* committee of the Colonial Research Committee has recommended the establishment of a research committee covering this group of subjects and the creation of a special Research Service, and that these proposals are being considered by the Colonial Research Committee. It has been decided to establish a Colonial Medical Research Committee and in conjunction with this it has also been decided to set up a Colonial Medical Research Service, separate in organization from the Colonial Medical Service. On the advice of the Committee, a scheme has been initiated whereby 25 colonial research fellowships will be awarded each year to enable young, but fully qualified, research workers to investigate colonial problems. It is hoped that this will result in the formation of a body of scientists with experience of colonial questions who may be available for the study of special colonial problems. Details of the conditions of the award of these fellowships is given in the report. In addition, the Committee discusses the general organization of colonial research and the distribution of responsibility between London and the colonial governments. Amongst the specific schemes approved during 1944 and listed in the report, those of interest to the veterinarian are the study of the part played by wild game as carriers or reservoirs of rinderpest, and pasture research.—T. E. GIBSON.

GREAT BRITAIN. (1944). **Colonial Development and**

Welfare Act 1940. Return of schemes made under the Colonial Development and Welfare Act, 1940, by the Secretary of State for the Colonies with the concurrence of the Treasury in the period from 1st April, 1943 to 31st March, 1944. pp. 16. London: H.M. Stat. Off. [8vo]. [3d.] **418**

A summary of the expenditure sanctioned under the Colonial Development Act during 1943–44 shows that the largest amount, £2,249,893, was appropriated for agricultural and veterinary development, the second largest item being £1,729,373 for water supplies and irrigation. The schemes of interest to the veterinary profession include the following.

Kenya—Experiments on the most suitable types of mixed farming and crop rotation for the maintenance of soil fertility. *Tanganyika Territory*—Rinderpest control. *Gambia and Gold Coast*—Establishment of a joint veterinary service. *Bechuanaland*—Tsetse-fly control in Ngamiland region. *Swaziland*—Establishment of a native dairy industry. *Barbados*—Provision of staff for comprehensive agricultural development including stock. *British Honduras*—Development of agriculture and food production. *Jamaica*—Expanding of agricultural services with the aim of checking soil erosion, improving fertility, and the adoption of a system of mixed farming. *St. Christopher and Nevis*—Enlarged scheme for a dairy farm and stud centre. *Virgin Islands*—The appointment of a veterinary officer, the development of a livestock farm, and the maintenance of tick eradication. *Research*—Fellowships to be awarded to junior scientists for the study of problems which can be most satisfactorily investigated in colonial territories; research into the part played by game as reservoirs and carriers of RINDERPEST; research into the improvement of pastures as a factor in the maintenance of livestock and the conservation of soil.

—U. F. RICHARDSON.

I. GREAT BRITAIN. (1943). **Alan, Duke of Northumberland Memorial Fund. Ninth report of the Management Committee on research work into sheep and lamb diseases with a report on grass sickness in horses.** [STEWART, W. L.] pp. 36. Newcastle upon Tyne: King's College. [8vo]. **419**

II. GREAT BRITAIN. (1944). **Northern Counties Animal Diseases Research Fund, Memorial to Alan, 8th Duke of Northumberland. Tenth report of the Trustees on research work into sheep and lamb diseases. With a report on grass sickness in horses.** [STEWART, W. L.] pp. 37. Newcastle upon Tyne: King's College. [8vo]. **420**

I. A description of the work and objects of the Fund is followed by brief notes on sheep diseases of common occurrence in the northern counties of England. The results of fairly comprehensive research on BORDER PINING in sheep and of a large-scale field trial of phenothiazine and mineral supplements are given. A disease of sheep known as "BLACK-RUSH" is described and a combination of *Trichostrongylus* infestation and malnutrition is tentatively suggested as a possible cause. Work carried out in an effort to prevent "GRASS SICKNESS" in horses gave inconclusive results. Methods of controlling the sheep tick, *Ixodes ricinus*, are suggested.

II. This is largely a repetition of the ninth report, but contains detailed results of field trials of phenothiazine and mineral supplements, involving the dosing of 7,236 lambs on 138 farms. A description of a hitherto unrecorded disease of sheep marked by acute rhinitis and cerebellar abscesses is given, and this is tentatively named "FALSE STURDY".—G. B. S. HEATH.

I. GREAT BRITAIN. (1943). **Fortieth annual report 1942-1943 of the Imperial Cancer Research Fund.** [GYE, W. E.] pp. 31. London: Royal College of Surgeons. [4to]. **421**

II. GREAT BRITAIN. (1944). **Forty-first annual report, 1943-1944, of the Imperial Cancer Research Fund.** [GYE, W. E.] pp. 31. London: Royal College of Surgeons. [4to]. **422**

I. One of the most interesting contributions to the report is that which describes the investigations of CRABTREE on the part played by sulphur metabolism in the artificial induction of cancer and its possible relationship to spontaneous mammary cancer in inbred strains of mice. The substance bromo-benzene is detoxicated by combining with cysteine and is then eliminated as a mercapturate; continued administration of bromo-benzene causes depletion of the body's cystine reserves and at the same time inhibits the formation of skin tumours produced by 3:4-benzpyrene. Other work described includes further work by PULLINGER on the localization of tumours in scars and healing wounds, observations by VAZQUEZ-LOPEZ on the reactions of the pituitary gland to long-continued oestrogen administration, and tissue culture studies by LUDFORD & BARLOW on spontaneous tumours and on the effect on fibroblasts of normal and malignant cells growing in association with them.

II. Further work by CRABTREE on sulphur metabolism in relation to carcinogenesis suggests that classes of substances which are capable of fixing labile sulphydryl groups all produce the biological effect of inhibiting the action of chemical carcinogens. It thus appears that sulphur is in some ways concerned in this type of cancer induction. The experimental facts conform to the hypothesis that the carcinogenic agent and the inhibitory substance may compete for sulphydryl-containing substances and thus there occurs delay in the process of cancer induction. By choosing suitable inhibitors, it should thus prove possible to enhance this antagonism or competition and thus possibly lead to complete prevention of the carcinogenic change. Experiments designed to test this view are now in progress.

Further work has been carried out on Bittner's "milk factor" in mammary cancer in mice, and on the induction of prostatic tumours in mice by injection of chemical carcinogens into the anterior lobe of this organ.—E. G. WHITE.

EIRE. (1943). **Annual report of the Medical Research Council of Ireland, 1943.** pp. 11. [fcp] [Mimeographed]. **423**

A list is given of the grants by the Council to individual workers for specific programmes of research; a summary is included of the work accomplished by grant holders and a list of their publications. The information of greatest interest to veterinarians concerns investigations made into the potassium equilibrium of liver tissue and of muscle. In the case of muscle it has been shown that, in the absence of K outside the fibres, the differential permeability to K breaks down and sodium is allowed to enter. The effect of a reduced K concentration outside is to simulate an entrance of Na into apparently normal fibres, whereas the results are to be interpreted as a progressive breakdown of the normal membrane barriers. An investigation into extensive K entrance into yeast cells during short-period fermentation has shown it to be due to an inter-change for hydrogen ions across the membrane. Based on theoretical considerations of this interchange, simple conditions can be set up in which yeast cells exchange so much hydrogen ion for K that the external fluid is brought to a pH of 1·7, forming a free hydrochloric acid solution of about N/10 strength. It seems likely that a similar mechanism may be involved in the

formation of hydrochloric acid by the gastric mucosa. Other investigations on such subjects as RICKETS, GOITRE and TUBERCULOSIS were dealt with from the point of view of human medicine.—T. E. GIBSON.

AUSTRALIA, WESTERN AUSTRALIA. (1940). **Annual report of the Department of Agriculture for the year ended 30th June, 1940.** pp. 31. Items of veterinary interest pp. 18–19. Perth: Govt. Printer. [fcp]. **424**

A brief outline is given of investigations on diseases of ruminants related to trace element deficiencies. ENZOOTIC ATAXIA of lambs and copper deficiency of sheep were prevented by top-dressing the soil with copper sulphate; a dressing of 20 lb. per acre was effective for at least two seasons. In "coasty" country, provision of Cu and Co has made possible the constant maintenance of cattle and sheep on areas where previously they could be kept for only a few months. Licks containing Cu reduced the incidence of "FALLING DISEASE" in cattle [see *V. B.* **10.** 854].

—H. McL. GORDON (AUSTRALIA).

I. BECHUANALAND PROTECTORATE. (1940). **Annual report of the Veterinary Department, Bechuanaland Protectorate, 1939.** [HOBDAY, J. H. N.] pp. 21. [fcp] [Mimeographed]. **425**

II. BECHUANALAND PROTECTORATE. **Veterinary Department. Annual report—1940.** [HOBDAY, J. H. N.] pp. 14. [fcp] [Mimeographed]. **426**

I. The department was mainly concerned throughout the year with the control of disease, improvement of livestock, observation of livestock export regulations, and improvement and grading of hides and skins; it also co-operated with the locust department of the Union of South Africa in connexion with the eradication of locusts. The staff included six veterinary officers and one animal husbandry officer.

Livestock registration and mortality returns were beginning to provide a statistical picture of the position of the livestock industry, and attention was drawn to the heavy losses caused by the attacks of wild animals. Livestock improvement centres were focusing native attention on improvements in animal husbandry, and export of stock was increasing.

ANTHRAX and BLACKLEG were dealt with by vaccination and sheep scab by dipping. CONTAGIOUS ABORTION was found to be endemic, and as one case of DOURINE was encountered, investigations were begun on the prevalence of this disease. The work of treating cases of TRYPANOSOMIASIS with tartar emetic at special centres was continued, 2,797 animals being returned to owners out of 3,096 treated. Fly control investigations were sanctioned and an officer-in-charge appointed.

The development of the Karakul sheep industry made steady progress, and native veterinary education was begun, short courses in veterinary science being given to cattle guards.

No facilities exist for research work.

II. This report covers similar activities to I. Another animal husbandry officer and a trypanosomiasis officer were added to the staff. The numbers of cattle exported during the year reached 33,982, the highest recorded since 1925, and the cattle population increased from 671,011 to 732,978. The dipping tanks provided to remove ticks from cattle for export enabled neighbouring owners to dip their cattle.

Large numbers of able-bodied Africans were employed in the mines and their absence from their homes tended to retard the adoption of improvements in animal husbandry. No scheme was introduced to deal with CONTAGIOUS ABORTION. DOURINE was found to be enzootic, as many as 40% of horses giving positive reactions in some areas. The disease has a low virulence. Affected stallions are castrated and reactors branded. Outbreaks of RABIES occurred in north-west Ngamiland; the area was placed in strict quarantine and all dogs therein were shot. Some of the livestock improvement centres made such progress that they were to be handed over to the management of the tribal councils. Breeding stock in these centres was tested for CONTAGIOUS ABORTION, and the herds divided into reactors and non-reactors. The calving levels rose to the highest recorded, 71%. HEARTWATER caused severe losses to some of the sheep flocks at these centres. The Karakul industry did not progress, owing to difficulty in getting rams. It was not found practicable to continue the veterinary courses for Africans.—U. F. RICHARDSON.

BECHUANALAND PROTECTORATE. (1942). **Annual report, Veterinary Department, 1941.** [HOBDAY, J. H. N.] pp. 11. [fcp] [Mimeographed]. **427**

In general the position of the livestock industry was fairly good; there were 805,682 cattle and 524,088 sheep and goats. The gross value of the livestock exported was £249,600; the cattle export levy fund increased by £4,880 to a total in December 1941 of £25,700.

No serious outbreak of a scheduled disease was reported. Sixteen outbreaks of ANTHRAX were confirmed; 567,795 doses of anthrax vaccine were issued and 75% of the cattle had been vaccinated. There were 787 suspected outbreaks of BLACKLEG, 50 of which were confirmed. BOVINE CONTAGIOUS ABORTION is enzootic and difficult to control. Severe losses occurred in the Ghanzi district. In the livestock improvement camps, segregation was practised with success, the disease being then much less evident. 2,931 agglutination tests were carried out. In 1940, all DOURINE-reacting mares and stallions were branded and the stallions castrated. A small proportion of the reactors afterwards died. Of 749 blood samples tested, 93 reacted. 1,218 cattle were treated for TRYPANOSOMIASIS in Ngamiland and 98 died; 100 others were treated in the Chobe district. Evidence of the mechanical transmission of the disease was obtained from a number of observations. When the transmission is direct (non-cyclical), the symptoms are said to be more severe and more rapidly fatal than when transmission is by tsetse fly. STRONGYLOSIS, particularly in sheep and goats, LAMSIEKTE [BOTULISM], VELD POISONING, HEARTWATER, and HORSE SICKNESS all caused losses. The main causes of losses were poverty from starvation, and depredations by wild animals which were unusually severe owing to shortage of ammunition.

The seven livestock improvement camps for cattle and sheep progressed satisfactorily. As from March 1942, five of the camps were to become self supporting, the tribal administrations taking over financial responsibility.

Fostering of the Karakul sheep industry at Ghanzi was continued. Pure-bred rams were purchased in the Union of South Africa and the young stock were proving satisfactory.

Details are given of revenue and expenditure.

—J. A. GRIFFITHS.

BECHUANALAND PROTECTORATE. (1943). **Veterinary Department. Annual report, 1942.** [HOBDAY, J. H. N.] pp. 9. [fcp] [Mimeographed]. **428**

This report covers activities similar to those in previous years. The livestock population of the area and the export of stock both increased; more than 42,000 cattle were exported (to Johannesburg and Northern and Southern Rhodesia) during the year. TRYPANOSOMIASIS caused serious losses of cattle in Ngamiland, and the consequent evacuation of certain areas resulted in overstocking of others. Shortage of rain led to poor results at the trypanosomiasis treatment centre where, it is

said, animals which were cured were unable to regain condition. Of the scheduled diseases, CONTAGIOUS ABORTION and DOURINE are regarded as enzootic, and one outbreak of RABIES and one of SWINE ERYSIPELAS were recorded. Serious losses occurred from the depredations of wild animals (5,093 cattle and 9,478 sheep). The calving percentages at the livestock centres were not maintained. No progress was made in the veterinary education of natives.—U. E. RICHARDSON.

BASUTOLAND. (1943). **[Report of] Veterinary and Livestock Division [1942–43].** [HENDERSON, G. B.] —*Rep. Dep. Agric. Basutoland*, **1942–43**. pp. 10–15. 429

There was no change in the European staff.

Conditions for livestock were favourable in the summer, but unprecedented snow storms and cold runs were encountered during the winter. The economic aspect was favourable. The average increase in prices of beef and mutton for all grades was 30% higher than in the previous year. Livestock sold readily at the higher prices.

No outbreaks of ANTHRAX were recorded; 31,196 animals were vaccinated. Many outbreaks of BLACKLEG were dealt with by preventive inoculation; 15,706 cattle were vaccinated. The incidence of ANAPLASMOSIS was becoming more apparent; preventive inoculation was being carried out.

There was no increase in the incidence of EQUINE MANGE. 3,492,773 sheep, 2,914,163 goats, 47 cattle, and 660 horses were treated for NEMATODE INFESTATIONS. 117,560 sheep and goats were treated for LIVER FLUKE INFESTATION. 22,126 sheep and goats, 2,000 cattle, and 1,000 horses were castrated.

About 10 million lb. of wool and 1 million lb. of mohair were exported. The schemes for the improvement of equines, cattle, pigs, and poultry are being successfully maintained.—J. A. GRIFFITHS.

TRINIDAD AND TOBAGO. (1943). **Report of the Agricultural Policy Committee of Trinidad and Tobago [part II] and summary of recommendations of parts I. & II.** pp. 56. Trinidad & Tobago: Govt. Printer. [8vo] [18c.] 430

It is suggested that a central veterinary research laboratory should be established to study the following problems:—BRUCELLOSIS and abortion due to causes other than brucella; TUBERCULOSIS of domestic animals in the tropics, including tuberculin reactions; JOHNE'S DISEASE—incidence and cause under tropical conditions; MASTITIS in dairy cattle and goats—causes and methods of prevention; ULCERATIVE LYMPHANGITIS—studies on means of eradication and treatment; TROPICAL DERMATITIS of animals—causes and control; TROPICAL SORES in donkeys—causes and methods of control; EQUINE ENCEPHALOMYELITIS—incidence in the Colony; SWINE FEVER—studies in immunization with killed virus; bat-transmitted PARALYTIC RABIES—the relation of the virus to ordinary rabies virus; West Indian parasitic problems—including TICK-BORNE DISEASES, HELMINTH INFESTATIONS of ruminants, and the pig kidney worm (*Stephanurus dentatus*); poultry diseases in general; artificial insemination of livestock and related problems; STERILITY; DEFICIENCY DISEASES.

It is also suggested that routine diagnosis and other routine work should be undertaken. The staff proposed is two veterinary research workers, but it is suggested that the establishment of a central laboratory for veterinary research on a West Indian basis should be considered.—J. A. GRIFFITHS.

—. (1943). **Report of the Veterinary Committee on Biologics [U.S. Live Stock Sanitary Association].**—*Proc. 46th Meet. U.S. Live Stk sanit. Ass.*, **1942**. pp. 158–162. 431

The report is entirely devoted to an account of an unsuccessful attempt by the committee to oppose the decision of the U.S. Department of Agriculture not to implement amendment 15 of Bureau of Animal Industry order 376. This amendment, which was to become effective on January 1st, 1943, made it obligatory for producers and vendors of viable biological products to report all sales of such products to the Federal Bureau of Animal Industry and to the Chief Live Stock Sanitary Official of the state in which the sale was effected. The amendment was opposed by the manufacturers and vendors of the products who considered that their interests might be affected.—D. D. GEVERTZ.

See also abstr. 345; 376; 399 (committees, U.S. Live Stk Sanit. Ass.).

BOOK REVIEWS

—. (1943). **Micurgical and germ-free techniques. Their application to experimental biology and medicine. A symposium.** [Edited by REYNIERS, J. A.] pp. vii+–274. Numerous figs. Springfield, Ill. & Baltimore, Md.: Charles C. Thomas. [8vo] [$3.00]. 432

This symposium began as the result of a discussion between a group of specialists held at the University of Notre Dame, Indiana, in 1939. Each of the 11 chapters is written by either one or two of the group of 17 contributors. The first section comprises three chapters devoted to micurgical technique, the "basic technique adapted to the manipulation and observation of micro objects, animate or inanimate." There is an excellent description of the apparatus employed, including micromanipulators, micro-instruments, moist chambers, microscopy, illumination, and the construction of cells for the cultivation and observation of single-cell cultures. The second chapter describes the application of micurgy to the study of the surface chemistry of living cells, with particular reference to ab-protoplasm interfacial phenomena. Chapter three deals with the use of micurgy in botany, especially in studying disease, e.g. single cell isolation and experimental infection with viruses, bacteria, and fungi.

The second section deals with the technique of what the editor terms "the pure culture concept": this consists in isolating a unit (micro-organism, plant, animal) from its natural environment and surrounding it with neutral barriers which protect from contamination and enable the experimental environment to be rigidly controlled. The technique has been developed since 1929 by REYNIERS and others to a stage where it is possible to obtain animals by Cesarean section without contamination, rear them under germ-free conditions, and even breed from them through several generations (work now in progress). The complete system as now employed includes special cages for rearing, storing, transfer, examination, and surgical operation. Combinations of these types of cage can be used, according to the type of experiment, and a control panel regulates steam sterilization, sterile air, water, vacuum, temperature, and humidity. G. pigs, rabbits, mice, rats and chicks have been successfully reared under these conditions. G. pigs and chicks have proved most suitable and experiments involving the breeding of germ-free fowls through several generations are nearing completion. Two rhesus monkeys have also been reared and have proved easier to rear in these circumstances than any of the other species. Young

to the large size of the cages required for fowls, work is being carried out on Bantam chicks and has so far given promising results.

Chapters are devoted to the use of germ-free invertebrates and plants and to the experimental infection of the foetus with bacteria and viruses.

The last three chapters deal with the control of cross-infection, both air-borne and by contact, in hospitals, particularly in maternity hospitals. Double cubicles are used and the fresh filtered air supplied to the infant in the inner cubicle is kept at a slightly higher pressure so that the flow of air is away from the baby when the isolation barrier is broken by the nurse. The results of this technique are described and illustrated. Experimental units were constructed at an infant hospital and attempts were made to eliminate cross-infection. Contact infection was completely controlled by the individual aseptic nursery technique and air-borne infection by the addition of air conditioning and the use of ultra-violet light. *Bacillus prodigiosus*, when sprayed in a cubicle or corridor of the control unit penetrated into all the other cubicles; this did not occur when the double cubicle system was used. The survival time of the organism was greatly reduced by ultra-violet light. The efficiency of the technique can be judged from the fact that g. pigs delivered by Caesarean section were reared in the special infants' cubicles entirely free from contamination for 20 days and even longer.

There is a useful bibliography at the end of each chapter, and the text is supplemented by many photographs and drawings. There is a good index and the printing and binding are excellent. Professor REYNIERS and his co-authors have produced a very valuable book and one which will certainly become a classic. Apart from being essential for all who are engaged in work on micrurgy or germ-free methods, this book can be read with interest by a much wider public.

—E. G. WHITE.

SMART, J. [Ph.D., Assistant Keeper in the Department of Entomology]. (1943). **A handbook for the identification of insects of medical importance.** pp. x+269. 13 plates, 178 figs., 1 appendix. London: Trustees of the British Museum. [4to] [15s.] **433**

Dr. Smart's book on the identification of Old World insects known to affect man fills a long-existing gap in the literature of medical entomology. The major part of the book is devoted to the Diptera with a section on the identification of larvae. A comprehensive chapter on fleas is contributed by Dr. Karl JORDAN. Brief descriptions are included of arthropod groups other than Insecta. While the book does not deal specifically with pests of veterinary importance it should be possible by its use to determine the family or genus of such insects. The non-specialist will find very valuable the introductory sections on the structure, classification, and nomenclature of insects. The numerous illustrations are excellent and will prove a great aid to insect identification, and there is a useful appendix on methods for collecting and preserving specimens.—J. B. CRAGG.

BARGER, E. H. [D.V.M., Berkeley, California, Formerly Pathologist in the Illinois State Department of Agriculture], & CARD, L. E. [Ph.D., Professor of Poultry Husbandry at the University of Illinois]. (1943). **Diseases and parasites of poultry.** pp. 399. 83 figs. London: Henry Kimpton. [8vo] [3rd Edit. revised]. [18s. 6d.] **434**

A third edition of this text-book was rendered necessary by the important advances made in poultry research since the printing of the second edition in 1938. Although written from the point of view of poultry diseases occurring in North America, the book should be of great value to all veterinarians interested in the disease problems of the poultry industries in other countries, particularly to those engaged in field work in this connexion. It should also be useful to veterinary students and to recent graduates desirous of increasing their knowledge of this subject. There is not sufficient detail to satisfy the specialist or research worker, but the fairly comprehensive list of references given at the end of each section will be appreciated by this type of reader.

Most sections in the new edition have been re-written and some are considerably enlarged, including accounts of diseases not mentioned in the previous edition. This is most marked in the case of virus diseases, and in this section a new infectious disease of chickens and turkeys is described, which has been termed "respiratory-nervous disorder". In the section on protozoan diseases, there is an account of hexamitiasis, an acute infectious disease primarily affecting turkeys. *Leucocytozoon* infections and trichomoniasis are now dealt with in considerable detail. The account of salmonella (paratyphoid) infection has also been greatly extended in view of recent work.

—J. D. BLAXLAND.

MCCARRISON, R. [C.I.E., M.A., M.D., D.Sc., LL.D., F.R.C.P., Major-General, I.M.S. (Retired), Late Director of Nutritional Research, Pasteur Institute, Coonoor, South India], & MOORE, D. F. [M.R.C.S., L.R.C.P., D.T.M.andH., Late Senior Medical Officer, Colonial (West African) Medical Service]. (1943). **Food. A primer for use in schools, colleges and welfare centres, etc., in Africa.** pp. x+116. 1 fig., 1 plate. London: Macmillan & Co. Ltd. [8vo] [2s. 6d.]. **435**

This is a book for schools in which local African conditions are stressed, so that it is unsuitable for general use in the United Kingdom. The diets of millions of Africans are bad mainly because of the poverty of the people. As the authors state, education is the first step towards the "provision of food which will satisfy the physiological needs of the body." The principles of nutrition are simply described.

On p. 10 it is stated that "nine tenths of the blood is water", whereas only about four-fifths of the blood is water.—E. BOYLAND.

—. (1944). **The vitamins. A general survey for the practising pharmacist. Based on a series of articles which appeared in "The Pharmaceutical Journal" in 1938-39.** pp. 64. London: Pharmaceutical Press. [8vo] [2s. 6d.] [2nd (Revised) Edit.] **436**

This small book presents an up-to-date summary of the knowledge of the nature and properties of the known vitamins, with the available data on human requirements for vitamins A, B complex, C, D, E, and K. A chapter on the vitamin values of common foods shows the sources of vitamins in the daily diet. A brief account is given of the signs of deficiency of vitamins. Finally, the pharmaceutical preparations containing vitamins are listed with details of their potency and of the firms which are responsible for their manufacture. The publication should be a useful guide for the pharmacist and, in addition to an index, it gives a list of books from which more extensive information may be obtained.—A. M. COPPING.

See also absts. **295** (swineherds' disease), **359** (physiology and pathology of thyroid).

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